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Lectures on

Physiology by Benjamin Rush

Physiology considers the living body and its healthy functions; Pathology treats of the causes of disease, and the diseased states of the body Physiology treats of the circulation of the blood

This Science is of great importance in physick and Surgery. Botany Chemistry &c are useful to Physicians — The bones are like the letters of an alphabet it is Physiology which frames them into words — Anatomy may be compared to the outside of a picture, Physiology gives it its various shades they should go hand in hand — Physiology is a most entertaining study from it we deduce proofs of the existence of a deity. Haller, Blumenbach and Richerand are the books proper to be read, the last is the best. There are three ways of acquiring medical knowledge 1 Books 2d Lectures 3 Experience by a careful attention to the symptoms and changes of diseases as they occur in the ~~physick~~ practice of physic

1st <u>Books</u> In the practice of medicine, there are no books which I would recommend by them we acquire a general account of the principal characteristic marks of diseases But they are universally copies of each other. Nature is not sufficiently adhered to in the different writings on Medicine. Even names are assumed which do not exist; There is no Dr Manning in Europe & yet we have Dr Mannings diseases of women and Children

The minute symptoms of diseases and the variations of the pulse cannot be known from books

2 Lectures are preferable to books as they contain accounts of new diseases and theories in Medicine, they are retained more forcibly than what we read This method of communicating knowledge by Lectures took its rise from

no who delivered lectures on Philosophical subjects from Porches, Diogen
e cynic from a tub and the Peripatetics while walking in the mornings a
enings — I shall give you a few directions in attending lectures

1st Be punctual in your attendance; the loss of even a part of a lecture by
breaking the thread which connects the different subjects together may render
whole unintelligible

2d Do not take notes frm the Lect. or if you do do not copy them during the
course, It distracts the attention and prevents your acquiring the ideas of the
professor

3d Do not attend too many Professors at once, the last lecture you hear will
prevent your remembering the preceeding ones with any precision, your Ideas
will be vague and confused

4th Make it a constant practice to talk over the subject of the Lectures with
a friend, this serves as a test whether you remember them and will fix them
more firmly in your memory, if you cannot express the Ideas you have derived
from the Lectures you do not understand them

3d The third method is by a careful attention to the symptoms and changes
of diseases as they occur in sick people this is the best method of learning
the cure of diseases

The description of diseases as they occur in Europe are by no means appli
able to those of the U. States. Until within these few years the English &
American poets exhibited Roman manners and customs. Painters imita
ated Raphael & our pictures exhibited Italian landscapes. In like manner
ill the time of the illustrious Lydenham and Morton our books of medic
ine exhibited an act of Greek & Roman authors and practice

Within these 30 or 40 years Physicians have laid aside their folios and attempted the true Hippocratic art of studying medicine that is by observing carefully diseases as they occur and making observations themselves hence within 30 or 40 years past more important improvements have been made in medicine than in 100 preceeding years

Nature I repeat it must be your guide let her be observed with attention. This is the more necessary in the U S as our diseases differ very much from those of the W Indies or Europe – In vain will an American Physician attempt to cure diseases wh occur only in our own country by European practice or by that of the E & W Indies. Many Americans have lost their lives under the care of the most eminent British Physicians from the mild practice wh they used being incapable of subducing a disease of such force as they encountered – Again the diseases of our Country afford us a strong evidence in favour of this position – Epidemics for instance when have we had two Epidemics exactly alike in their Symptoms? they are never alike in different seasons

2 By visiting the sick and observing nature, a knowledge of the pulse can only be acquired by frequenting the bedsides of our Patients. By visiting the sick you also obtain a knowledge of those Symptoms wh cannot be obtained from books, as the minute variations in the pulse changes in the countenance and voice excretions of urine &c

3 The Combination of diseases may be learned which cannot be had from books. How frequently are worms and Hysteria complicated together and what author treats of the Symptoms and cure of this complication

4 We also avoid the acquisition of false theories in medicine a fruitful source of error I think Dr Cullen justifiable in asserting that you will find 10 false facts for 1 false theory in medicine

5 You will avoid deception few authors describe a new appearance in a disease without some exaggeration

6 By early habits of visiting the sick you will conquer the reluctance with which some young minds visit sick rooms and subdue those feelings which often intrude on the mind at a time when the exclusive consideration of the patients case is necessary

7th The impressions wh diseases make on our minds are much more durable than from Lectures or Books. In a word I would as readily believe a man could learn to swim by reading a treatise on that subject without going into the water as that he could learn to cure diseases without attending to the Sympts and various circumstances with them

Directions for visiting the Sick

1st visit your patients at least once a day in all acute or dangerous diseases
2 visit them at the same hour every day, by doing this you never surprise them
in any situation wh^ich^ render your visits unpleasant. Again you will not
disappoint them, you catch your patient at the moment of hope and a few words
dropt from a physician has often done more service than the most power-
ful of Cordials. I once new a lady kept awake all night by her physician
not coming at the appointed hour

3 Have your medicines given as soon as possible after they are prescribed
4th Have your medicines put up with taste and care and write your direction
in a legible hand; numerous and fatal are the consequences of neglecting
this. I have known Aq Fontan. to be written so badly as to be decyphered
Aq Fort; the apothecary used the nitric acid, the patient took it and died
another wrote so badly as to be mistaken for Vinum Antimo
iale here the consequence was also fatal

Never visit your patients too early or too late I must here also reprove
the contempt with which young physicians hold the office of apothecary
as well might a man expect to be a good general without previously
being a soldier as a Physician to be a good one without being an
apothecary the names of Cullen, Watson, Fothergill &c might be sufficient
to reprove this foolish pride, all these were once apothecarys boys. I
shall date the decline of the utility of our science in this Country
from this foolish and idle spirit. Besides those patients who have
most need of an apothecary are those from whom we derive most
of our profits, Hence we find starving Physicians and rich Apothecaries
Adhere to this caution then be your own apothecaries

5th Never neglect common complaints for uncommon ones; while the

celebrated Dr Hamilton was attending the practice in the Hospital at Edinburg a patient was admitted who had two heads. The Students were attentively examining the phenomenon Hamilton alone was feeling the pulse of a patient with a common intermittent fever; he observed he sh.d probably never again meet with a similar circumstance, but fevers he sh.d perhaps see every day of his life and that they were consequently of more importance to him than all the monsters in the universe. In like manner you had better be acquainted with the cure of fevers, than of Cancer or Aneurism or other rare diseases; It w.d be comparatively of small importance of all our patients with cancers were to die, if we c.d cure all the fevers which daily occur

6th Sit up with your patients at night, much may be learned by this wh otherwise you w.d not be acquainted with. Positions of the patient in bed, Heat and Cold, Respiration and Perspiration may all give useful hints with respect to his cure. By pursuing this line of conduct we are able to perform venesection in difficult critical cases as often and as copiously as we please or give Bark, Wine, Opium &c at the most proper times I once knew a physician get into handsome practice by sitting up with a patient at night who had an intermittent fever, by doing this he was able during the remission of the fit to pour in the bark plentifully and thereby cured his patient

7th Never quit your patients till they are perfectly cured, Patients are too apt to think themselves so before they really are. The advice of a Phys.n is necessary to a convalescent in several things, but diet, dress and exercise s.d be particularly attended to. Other circumstances may and often do occasion relapses, but the neglect of physicians is too often the shameful cause of them

8 Let no business or pleasure prevent y^r attendance on Patients, when a physician undertakes the cure of a patient, he enters into a compact with that patient and it is unjust to neglect him

9th Always endeavour to inspire your patients with hope and confidence in your prescriptions "Conceit can kill and conceit can cure".

10 Treat the complaints of females with the utmost delicacy whatever may be their rank in life. I never knew a young phys^n prosper who neglected the complaints of ~~his~~ female ~~patients~~ or who treated that sex with any indelicacy

These particulars should be strictly observed in private practice

Practising in Hospitals is attended with conveniences and inconveniences. The conveniences are that medicines are administered with more accuracy than in private practise, the diet and exercise of the patient are regulated according to our desire and generally our government over our patients is more perfect than in private practice, But these advantages do not compensate for the inconveniences

The patients are in general such as from their mode of life are much debilitated and their constitutions broken down by strong drink &c moreover they seldom apply for relief to hospitals except in cases where their diseases have been unsuccessfully treated elswhere

Lastly the bad air, confinement to one room and want of clean=liness are great objections to hospitals. Those who have an opportuni=ty oh^d attend to both public and private practice

Clinical lectures are of great use in studying medicine first intro=duced into ~~practice~~ the Hospitals in Edinburg by Dr Rutherford

Forms of visiting Patients

1st The utmost respect is to be manifested. As soon as you enter the patients house pull off your hat; we sh^d consider the master of the house as present in every part of it. If his servant appears we are to recollect that he is the representative of his master and treat him with respect

2 If a lady conducts you up stairs go before her till you come to the top then let her precede you to the chamber of the patient. In coming down stairs walk behind

3d When you approach the chamber of your patient, give notice of it by a hem, cough or some other method — If you can conveniently send word of your arrival — Always knock at the chamber door. Here I must repeat it visit your patient at a particular hour, by doing this you catch him as it were at the moment of hope a disappointment is to him a serious misfortune

4th In consultations the Consulter sh^d go first to the patients room, even if he be the younger man; the consulted Physician should never feel the pulse of the patient till the other has in the presence of the patient mentioned the remedies w^h been used and a short acct of symptoms. Reason and Justice concur in demanding this, if the first physician were to go a minute or two before the other it w^d be better. The consulted physician sh^d not even ask a question without the consent of the consulting and the patient sh^d hear the prescriptions

5th When you enter the chamber of y^r patient sit down on a chair or trunk if there be neither in the room on the bedside of y^r patient, pull off y^r gloves and great coat if it be winter, if the latter be wet it must not be in y^r patients room — Never feel the pulse so soon as you enter the room. Dr Fothergill relates the case of a physician being discharged for feeling his patients pulse with his gloves on. Be careful not to enter into any conversation with

your patient before you feel his pulse, conversation having very great influence on the pulse. When you have done this, the history of the case had better be acquired from the patient himself, he is certainly the best judge of his disease, tho' probably the worst judge of its cause; his friends must inform you of the last

The follow^g are Quest^s necessary to be asked 1st How long have you been indisposed? 2^d How, when and where were you first seized 3^d What time of the day and what were you doing when taken 4th at home or abroad 5th Walking sitting &c 6th Your next 2^ds sh^d be relative to the remote cause of the disease, here as I before observed the patient is seldom a proper person to interrogate, his friends acquaintances and in some instances his enemies should be asked. He will seldom confess that intemperance is the cause, if it sh^d be

Your next 2^s may be more general as of the diet, drink, exercise & clothing of y^r patient, also his business and pleasures, Whether he has been exposed to cold &c not only in respect to the day on w^h you were called, but several days previous to his disease. Heat and Cold are very common causes of diseases. Enquire if your patient had ever been affected in like manner before, if not what diseases he has been subject to, Also his mode of life for a considerable time before. The Gout at 40 years of age is frequently the consequence of intemperance at 20 or 30 & blindness at 50 from accidents at 30. I once knew a person who was affected with seminal weakness in old age w^h was brought on by Onanism while a boy at school. Diseases of the brain have been often induced many years after the accident by a stroke on the skull. A Gentleman had a violent pain over the right eye brought on by his schoolmaster lifting him up by the hair in order to shew him London

Had the patient ever the disease before? if so what was the cause? How was he cured? Where were you when sick? Did it alternate with any other disease?

Consumption has been known to alternate with Rheumatism, you had better excite the latter as it is less dangerous than Phthisis. Had you ever any cutaneous diseases? if so did they suddenly disappear. This has frequently been a source of disease wh perhaps may be cured by again exciting the cutaneous disease

Never be deceived by the medicines which have been used, if your patient has a diarrhea ask if he has been taking any medicine to purge himself; black stools are frequently occasioned by steel, Itching of the skin and sickness at the stomach by opium, Dysuria also; black tongue by tobacco &c &c

The age of the patient must also be known, particular ages have their particular predispositions to disease, This must be more especially sought after in Females; the Catamenia shd never be lost sight of in female complaints, From 14 to 15 years of age is the usual time of its commencement and it continues till 45 or 50. The peculiar predispositions of the natives of different Countries are to be enquired after. — Thus Dr Hillary informs us that the Intermittents of the Negroes in Barbadoes, terminate in a swelled leg. A mulatto girl from that Island whom I cured of that disease in this City, had a swelled leg in consequence

Enquire also concerning the diseases of the patients ancestors, many diseases are hereditary and such are more difficult of cure. The most common of these are mania, gout, and Consumption, the prognosis in these diseases is not flattering. Enquire if there are any particular family medicines wh have been much used in the complaints of your patients. Intemperance in this as in other respects can only be learned by enquiring of the friends of the sick or by eating with them occasionally. I once detected the cause of violent bowel complaints in a lady by dining with her. She ate an immense quantity of mustard and pepper & all her food was very high seasoned

The King of Prussia perhaps the greatest glutton that ever lived used to say he scarce ate enough to keep body and soul together
But I must repeat the necessity of attending to the uterus in all female complaints and to the teething and worms in children. In Gluttons and people in high life I wd never loose sight of the gout

I next proceed to treat of the Quest.s to be asked concerning actual diseases.
1st The first Qr you shd ask yr patient is whether he has pain in any part & where is the pain seated? Whether in the bones head breast &c. The head is the most dangerous seat of pain. In the bones it is not dangerous. Our indications of cure are to be varied according to the nature and seat of the pain, enquire concerning the appetite for food. drink &c. The further they vary from health the more danger is to be apprehended. An increased thirst attends fevers in most cases, if it be excessive the patient is very ill. Enquire concerning the alimentary canal and Urinary organs much is to be learned from the state of these. Costiveness is a bad symptom, also obstruction of the secretion of urine. The colour of the urine is also a matter of some consideration, high-coloured urine occurs in fevers

The Sleep of our patient shd be taken notice of and also the state of the mind both in acute and chronic diseases, observe also the position in bed whether it is natural or not. This is of consequence not only in acute but also in chronic diseases; if the patient be continually on one side, some viscus probably the liver is affected; observe also his respiration when asleep as well as awake

2 The Countenance of the patient will give some insight; many diseases appear in the faces of the sick. The Ly Fever in a remarkable degree. Violent fevers are generally attended with a flushed countenance. A Gloom is observable about the forehead in Consumption. In the Stone

a melancholy countenance is remarkable, & according to Dr Lettsome Hydrocaph. Intern may be known by the countenance. Mania is most always evident in the face

When you enter yr patients room at night be sure to have a light that you may observe his countenance, observe his eyes whether red or not. Some Physicians have supposed the natural colour of the eyes capable of giving information relative to the disease. Thus black eyed people are supposed liable to the sore throat and consumption. The pupil of the eye is dilated in affections of the brain. Examine also the colour of the hair red haired people are supposed to be liable to the consumption. Examine also the teeth I have often found bad heath to be the consequence of bad teeth. as imperfect mastication ~~produces~~ causes indigestion and produces stomach and bowel complaints. Respiration and Perspiration sh be attended to. the Skin and lungs are much affected by many complaints. Dry skin occurs in fevers. Indications are also to be drawn from the quantity of perspiration the & Sudor. The voice is of consequence to be observed a squeaking voice indicates an affection of the trachea as Cynanche Trachealis &c, Hoarseness is also a bad symptom. Any deviation from nature in the voice is dangerous, & the farther the deviation the greater the danger. Next the tongue sh be noticed, this is dry in inflammatory fevers, in malignant fevers black. A yellow furred tongue is common in fevers. In typhus the tongue is generally dry

But dont be deceived, medecines and food often change the appearance of the tongue; port wine & claret colour the tongue black. Tobacco current jelly liquorice &c do also I have been often deceived by tobacco

A black tongue most always indicates death, Red is more favourable. In general the more unnatural the tongue the more dangerous, but a perfectly natural tongue in malignant fevers is one of the worst symptoms with wh I am acquainted

The nails are also to be inspected — red nails are favourable. I once lost a patient in Malignant yellow fever where the nails were only tinged yellow

Never leave a sick room without naming the disease; else you will be thought ignorant

Most physicians have been remarkably attached to some one of those indications, some have depended on the tongue, some on the countenance, some on respiration &c &c. But I hope my pupils will be distinguished by their knowledge of and attachment to the pulse. Many useful truths are to be learned from other parts of the body, and I wd have you to neglect none, for my doctrine rejects none, but in it the greatest homage is paid to the pulse

Pulse

The pulse may be called a nosometer or compared to the dial plate of a watch or clock, it informs us of all that is going on within. In order that we may acquire an accurate knowledge of the pulse in its diseased state it is necessary that we shd be acquainted with it in its healthy state and also in the different stages of life

The Healthy pulse is soft open moderately vigorous free from all sense of resistance and at equal intervals between each pulsation – This state differs under different circumstances. 1st It varies according to the age of the person – at the commencement of life or a few days after it the pulse ranges between 130 and 140 strokes in a minute. Towards the end of the first year 140 at two years of age from 110 to 120 at 3 years from 80 to 100 at 4 5 or 6 years of age from 80 to 100 & at 7 from 90 to 72

1st In adults it is from 60 to 80 generally 66 in the minute. In old age it is less frequent and more full, it is also intermitting. This is frequently so much the case that when otherwise, it shews signs of disease. At the age of 60 the pulse beats 60. In an old man of this city it beats only 36, in some according to Dr Heberden it descends as low as 26

2 Sex influences the pulse, that of females being more frequent than males, as women are more irritable

3 Different stages of society or civilization influence the pulse, It is slower in savages than in persons brought up in a civilized state, Savages want the numerous stimuli of thought, conversation &c which civilized people enjoy, hence too the pulse is less frequent in countrymen than in townspeople. I felt the pulses of 10 Indians in the year 93 and found it at 60 in 8 of them, in the other it was at 70 but one had been sitting previously before a fire and the other was the son of a Frenchman

* This & the many other instances prove the set forth disposition of the Dec

Col Hawkins agent for the U States, with the Indians in the Southern states, without knowing my opinion relative to this circumstance examined the pulses of several tribes and found them to be at 40, which proves that my opinion is derived from facts only. All those who spend their time in Idleness have much slower pulses than those who are busily employed

4th The Size of people affect the arterial system; it is quicker in the short or low than in the tall. Haller says in very tall men it is not above 55

5 Climate and the different seasons of the year influence the pulse, being quicker in warm than in cold climates. In Greenland it scarcely exceeds 40 In the W Indies it is quicker in new comers than in the old inhabitants. In newly imported slaves than in those we have had for some time. Mr Volney who travelled through the Southern states in the year 98 and whose veracity I do not rely on in all cases tho I do in this, informed me that he never shook hands with a person in the fall season in those states that he did not perceive him to be labouring under a little febricula

6th Different times of the day influence the pulse. It is slowest in the morning, hence you ought always advise convalescents not to take exercise before breakfast, highest at noon and then gradually descends till evening, at bed time it is generally slowest on account of the exhaustion of excitability. Different degrees of light and darkness greatly influence the pulse

7th It is different in the sleeping and waking state, being quicker in the latter by 8 or 10 strokes

8 Different positions of the body influence the pulse, thus it is slowest when on the back, quicker when on the sides, quicker still when sitting

up, and quickest when in an erect posture

9th Fasting food and drinks especialy such as are stimulating influence the pulse. It is accelerated by a full meal and decreased by fasting for some time, but afterwards it rises, so persons who die of famine die of a fever

10th Different positions of the arm influence the pulse when the arm has been exposed to cold for some time, the pulse becomes much slower and also when the arm is under the body.

11th Exercise of the understanding & the passions of the mind influence the pulse those of a sedative nature lowering it & vice versa. Grief reduces it below 60 Anger quickens it to 140

12th Conversation quickens it, hence the propriety of feeling the pulse before the patient begins to describe his disease

13th Bodily exercise. If the natural state of the pulse be 64 when sitting standing will increase it to 68 walking at the rate of 2 miles an hour 78. 4 miles 88 & running from 140 to 150 in a minute

14th Pregnancy quickens it. It is also quicker when the menses begin to flow and during menstruation. It is of consequence to know this in chronic cases of disease. All pregnant women have their pulses preternaturally quick or slow

15th Certain medicines quicken the pulse, such as opium, vomits, Purges, Bark, Blisters, Steel, Hot & cold baths &c Blisters affect the pulse more or less according to the parts to which they are applied. We M.D know the blistering pulse, Opium pulse, Mercurial pulse &c to distinguish them from the morbid pulse

16th Coughing quickens it

17th Fear influences the pulse I have seen it fall after prescribing Vfr
18th Intensity of thought influencing respiration lessens the pulse

There are some deviations from the general rule as regards the pulse Judge Peters of this city in commendation of whose talents I cannot say too much has a pulse of 100 strokes in a minute when in good health & 60 in a high fever, In others it is preternaturally quick, I have heard of a clergyman whose pulse in a healthy state beat 100 strokes in a minute. A fever afterwards restored it to between 60 & 70 and there it remained. there must have been too much excitability in his system which diseased or morbid state was removed by the action of the fever.

Morbid States of the System

Before I enter on these I shall make a few observations

1st The Heart and arteries are connected and invested with muscular fibres possessing great irritability, or a susceptibility of being acted on by different stimuli hence if one part be affected the whole will sympathise, They may be compared to the sensitive plant or the bells of the Jewish high priest, touch one & the whole will ring

2 The heart and arteries possess irritability

3 The same motion which is excited in one part of the arterial system is communicated to others by continuous sympathy. This is illustrated by the case of Hicks who died in this city with an enlarged omentum which pressed upon the aorta and diminished its diameter two thirds, which affected the whole arterial system for his pulse was very small and thread like, This will lead to the explanation of many other ~~circumstances~~ appearances for in most diseases we may expect the same kind

a
for

of action in the artery as in the diseased part. In the pulse tense in acute pneumony, the same occurs in the whole arterial system in inflammation of the pleura. Are the vessels of the lungs engorged in Pneumonia Notha the same occurs in all. Is the pulse soft the vessels are so engorged that they cannot put on a tense action, are there intermissions in the pulsations of the heart, the same takes place in the whole arterial system. Is the stomach or upper bowels inflamed? the pulse is tense but small, because the vessels of these parts are small. The pulse is more tense and full in inflammations of the Colon, only because the arteries of the Colon are larger. If the pulse is not small in opthalmia & inflammations of the Joints it is only because the larger vessels are brought into sympathy by contiguity

But there are diseases in which the pulse does not sympathise, but these are few and may arise from the following causes

1st From a weakness in the heart itself 2d from a disordered state of the artery at the wrist 3 From a want of irritability 4th From say focated excitement 5th From large portions of fat pressing upon the pulse 6th from an accidental pressure of the muscles of the arm by the position of the body 7th From cold 8th From want of irritability in the contiguous parts 9th From want of sympathy in the heart preventing it from equalizing the action of different parts or 10th from the disease being insolated in the lungs as in Catarrh and as in some diseases of the uterus, in these cases the artery does not sympathise, 11th From unequal excitement in the blood vessels, this want of harmony accounts for the fact mentioned by J. Hunter 0.97 legs blood with a natural pulse, There may be great disease in one part

with little action in another; let not the number of these exceptions pre=
clude the feeling of the pulse, for they do not occur in more than one
case in twenty & we sometimes see the absence of pain in Malignt
fevers when the tongue is foul & vice versa in diseases of less conse=
quence

The morbid states of the Pulse are known 1st by its frequency & quickness. These
are not necessarily connected for the pulse may be very quick and yet not frequent, By
frequency is meant the number of strokes in a minute, by quickness the time in wh
each stroke is performed, The pulse varies from health in frequency and fulness
in y fever and some acute diseases It has been known to vary frm 60 & 80 to
180 and even 200, and falls in some diseases to 40, 30, 20 & in one or two cases
to 9 in apoplexy it falls as low as 7

The quickness is probably caused by an irritable state of the bloodvessels
which irritability I conceive to be occasioned by the stimulus of Miasmata hence
it, occurs in intermittents y Fever &c This circumstance in some cases gives
rise to the intermitting pulse, this is when there is a cessation of pulsation
for some time after every 1st 2d or 3d stroke & frequently occurs in Malignt
fevers

The slowness may depend upon 3 Causes 1st Pressure as in apoplexy and Palsy
the pulsations being equal to each other but intermissions occur 2d Spasms
of the Heart & 3d Defect of irritability in the arteries

The morbid states of the pulse may be known 2dly. By their force and
irregularity they is of more consequence than variation in frequency quickness
and fulness also by imparting a jerking sensation to the fingers resembling
a shattered quill. —

We now proceed to consider the different states of the Pulse as they occur
in fever

1st The Depressed Pulse – This state of the Pulse is occasioned by Stimuli acting so violently as to depress the system below the point of reaction or by pressure on some great vessel It often descends as low as 40, 30, 20 and sometimes so depressed that it is imperceptible. It is raised by B.S. It is sometimes preternaturally frequent or slow attended with intermissions P sometimes natural It occurs in the Plague Y. Fever S pox and in the Pleurisy It is either partial or general, occurring in the extremities in the former, and in the latter in the whole arterial system, occasioned by Stimuli depressing the strength below the healthy state, In this depressed pulse the Heart & arteries possess their irritability It resembles the weak or Typhus Pulse the following directions will serve to distinguish them – 1st The depressed Pulse is known by its occurring in the beginning or forming state of Fever or in the Paroxysm of such fevers and other diseases as are periodical

2 By imparting a sensation of tension to the fingers when long and attentively felt

3 By occurring in morbid affections of the brain heart & stomach & Bowels more frequently than in diseases of other parts of the body

4th By its being raised by B.S, Purges & taking off the morbid excitement

5th By its being frequently attended with ~~slowness~~ preternatural slowness and intermissions, This pulse may be compared to a willow which bends under the storm & rises again so soon as it is over, while the typhus resembles a tree shattered by lightning and which cannot be raised unless by the hand of art

2 The Catgut Pulse is small quick and tense. It is generally quick but not always frequent. it imparts a sensation to the fingers similar to that

produced by feeling a peice of tense catgut whence I have named it. It occurs in malignant fevers

3d The Lynochus Fortis, The reverse of the two former a full round vigorous frequent & quick pulse without hardness wh occurs in the highest grade of bilious fevers &c Exercise produces a pulse somewhat similar to this

4th The Lynocha or common inflammatory pulse being full, quick frequent & tense but not round & is attended with heat thirst &c It occurs in common inflammatory fevers, This pulse exists sometimes in the plague, Y Fever, Jail Fever & Small pox but more frequently in Pneumonic affections, Rheumatism and arthritis, It imparts a sensation like a large quill

5th The Lynochula. A quick frequent moderately tense but small pulse a diminutive of Lynocha, imparting a sensation to the fingers similar to a small quill & occurs in chronic Rheumatism, Gout Consumption &c and in the 2d stage of fevers

6th Lynochus Mitis. This is full round soft and frequent occuring in mild bilious fevers

7th The Lynochoid This is alternately a soft and hard pulse, feels like a shattered quill and is a compound of Lynochus fortis & Lynocha it occurs in the passage of fevers from the low ~~state~~ inflammatory state to the low state or in the passage from an acute into a chronic ~~dis~~ disease It feels like a quill that has been trodden on

8th The Typhoid, This is a frequent pulse with a full round and tense stroke, it occurs in the chronic state of fevers, in the hectic and puerperile and in scarlatina. the pulses preceding Typhoid are above par those succeeding it below

9th The Typhus this is a quick small frequent but not fuller tense pulse, it occurs in the low chronic state of fevers, also in the close of inflammatory ~~phis~~ eases, when depleting remedies have not been used in the first stage, the bloodvessels in this appear to be deprived of a part of their irritability. it is here that V.S is forbidden and stimulants are to be given

10th the Hectic pulse. the forms of this pulse are various being occasionally Synochoid, Typhoid & Typhus It occurs in Phthisis pulmonalis Gout & Tabes from the lues venerea & Scrophula

11th The Hobbling pulse is unequal or fluctuating tense quick and very frequent it may be divided into two 1st One two or three weak strokes succeeding a strong one and 2d One two or three slow strokes succeeding a quick one

12th The Dicrotus or Caprisans

13th the Serrated Pulse. This pulse strokes the fingers like a saw that is with one part above the other

14th the Vermicular Pulse. Small frequent and resembling the ~~creeping~~ motions of a worm

15 The Creeping pulse Weak and small, scarcely perceptible and occuring at the close of life

16 The Morbidly natural pulse occuring in the worst stage of malignant fevers, great dangue is to be apprehended from this as it is supposed to happen only when the cerebellum is affected. It is scarcely to be distinguished from the healthy pulse

17th The Torpedo pulse imparts a sensation to the fingers resembling a shock of electricity. I have never met with this pulse but have no doubt of its existence

18th a Full bounding and slow pulse wh occurs in Palsy Dropsy &c It is especially slow in the affected side in Hemiplegia, I examined the pulse of a Paralytic patient whose artery beat on the affected side 50 strokes in a minute while on the other side it beat from 80 to 90

19th a Weak low pulse without inequularity occurs in debility without fever and is distinguished from the weak slow pulse wh happens in Malignant fevers by its occuring in Hypochondriacs and in the close of diseases

20th The aneurismatic pulse full tense and imparting a jarring sensation to the fingers, I once attended a gentleman affected with the dropsy, in consultation with Dr Physic and was surprized at feeling this jarring in his pulse, I asked him if there was not a tumour in some part of his body, he said there was none that he knew of, recollecting himself after a while he said he beleived there was one on the back of his neck but that it had never given him any pain; Dr Physic examined and discovered it to be an aneurism of the carotid artery. — An animal tumour frequently give rise to the intermitting pulse

21st The Gaseous Pulse Soft full and round but sinking even under the pressure of the little finger as if air was in the arteries. This pulse was discovered by Dr Galmast a French Physician who gave this name to it

Besides those morbid states of the pulse which I have mentioned there are others in which they are combined first, In double proportion as full and weak, full and quick, quick and frequent, depressed and weak slow and intermitting

2 They are combined in a threefold ratio as full strong and frequent small weak and slow &c

3 In a fourfold ratio, as full strong quick and frequent at the same time &c

A total absence of pulse often occurs in violent affections of the stomach and bowels and lasts for hours. I knew it once to continue in a lady for 36 hours in consequence of her eating eight hard roasted oysters and I have heard of its continuing for 2 or 3 and even 7 days, This circumstance occurs in what is called a trance

In order to satisfy your patients respecting the pulse wh sometimes they are extremely anxious to know, you shd compare it to a scale of 10 degrees with 5 above and 5 below par or the healthy point

The pulse is very much influenced by the strength of the body in a pidgeon it is 100 in a dog 80 In the ram the pulse has been known to beat 65 In an ox from 36 to 30 and in the horse a very

= Tiberius's physician felt his pulse while he was elevating it to his mouth to kiss it

experienced farmer informed me that it beat from 34 to 36 in England and the U States from 30 to 40 in the minute

Directions for feeling the pulse

1st Never feel the pulse of a patient the moment you enter the room, your presence excites hope fear or some emotion of the mind wh has an influence on it. If the weather be cold warm yr hands and feet first but beware of entering into any conversation with the patient its influence on the pulse I have already mentioned, so soon as these preliminaries are over concentrate your whole mind as it were in your fingers ends and apply them to the pulse, sportsmen say the first sight of a mark is always best, so is the first impression of the pulse to the Physician.

2d Place your whole four fingers on the artery and make an equal pressure with each, this will enable you to judge much more correctly than by using one finger only. The fingers of the right hand of the physician sh be placed on the left wrist of the patient and vice versa, our celebrated countryman Mr West has made a great mistake in this respect in his painting of "Antiochus's physician feeling his pulse to discover his love for Ethatonice" for in this painting the right hand of the physician is on the right arm of the patient which gives a very inelegant appearance, there is another painting of this at Mrs Malcoms in this City which is exactly as it ought to be, there is also another in our hospital which I would advise you gentlemen to examine

3d Feel the wrist of both arms, as there is in many cases a difference in the two from several causes. I have corrected my judgement frequently in

this manner. A woman brought her child to the Pensilvania hospital one day for the purpose of having it prescribed for, she was coming in as I was going out and meeting me she mentioned the circumstance of her childs illness, I examined the pulse of one arm which was lying uncovered and found it so feeble as to be scarcely perceptible, I then examined the pulse of the other arm and found it highly inflammatory in this case I prescribed according to the pulse of the last arm, the state of the pulse in the first was probably owing to exposure to the cold or to a kind of torpor in the muscles. — In this way I have from feeling the pulse in one arm prescribed bleeding and from feeling it in the other retracted my opinion

4th Never remove yr hand till you have felt 20 strokes. I have observed an intermission in the pulse at the 18th. The Chinese Physicians feel 49 and hence perhaps their accuracy in the pulse

5th If the state of the pulse be doubtful, shut your eyes, request silence in the room and to use an expression of Darwin "concentrate all sensorial power in yr fingers ends. The influence of light and sound detract from the accuracy of feeling

6th If the Radial artery be from any cause not easily felt, feel the temporal which is the next best. Here I must caution you never to apply blisters in such a manner as to prevent your feeling the pulse without inconvenience to the patient, if you do feeling it afterwards gives so much pain as to make an alteration in it. The temporal artery shd be felt in all diseases of the brain

7th Always feel the pulse before you prescribe any of the following medicines, Vomits, Purges, Vsn, the Hot and Cold baths, Pediluvium, &c Also

before the use of stimulating medicines as Bark, Wine, Opium &c Stimulating and Nourishing Aliments & Drinks as they all change the pulse

The ~~sensibility~~ of the fingers is very much increased by dipping them in warm water, I knew a clergyman in Jersey who was saved from premature interment by this circumstance, he had apparently died and his relations and friends had assembled to attend his corpse to the grave, the physician before he would relinquish all hopes called for a basin of warm water and after immersing his fingers in it for a short time went up to the coffin and taking hold of the patients arm, to his inexpressible pleasure found a pulsation; the company was dismissed, proper remedies used & the clergyman recovered and lived many years afterwards. What wd be the effect of rubbing the ends of the fingers over a rough surface wd not their sense of feeling be increased by the effect of contrast?

Thus Gentlemen have I related the knowledge of the pulse wh I have acquired by reading and experience for 50 years. It is scarcely necessary to enumerate the advantages and necessity of this knowledge as they must be sufficiently obvious to you. It is by this that we know when depleting remedies are necessary and in what quantity; also when the exigencies of the system demand stimulating remedies

The frequency of the pulse tho of little consequence when compared with its force and other characters, has been much relied on by the Physicians of Europe, especially of G. Britain. They use for the purpose of acquiring a knowledge of its frequency Minute watches, quarter minute watches &c but this is ridiculous & I hope will never be introduced into American practice

A Spanish Physician by the name of Solano has made many observations on the pulse, in some of which he asserts that 180 is the greatest number of strokes wh the arteries can beat consistently with the recovery of the patient. — 200 in Hydrocephalus is quite common, but whether ~~they~~ patient ever recovers I know not. The observations of Cullen are opposite to those of Solano he says Dr S observations are useless

Plato we are told had it inscribed over the door of the house where he delivered lectures to his pupils "Let no one enter here, who does not understand Geometry" In like manner were I to erect an university for the purpose of teaching medicine I would inscribe not only over the front door but over ~~they~~ doors of every apartment. Let no one depart hence who does not understand the Pulse

Animal Life

For my opinions on this subject Gentlemen I refer you to my printed Lectures

Animal Heat.

The first thing that strikes us on beholding a living Animal is the property of Life. The second thing is that of Heat.

1st It is the same in all climates & Seasons, as is evinced by Thermometers.

2d It is the same in all ages, in children & old people

3d It is the same in both Sexes under similar circumstances.

4th It is nearly the same in every part of the body in a healthy State – It is one degree greater in the Lungs than in any other part of the body.

5th It is the same in Solids and fluids.

6th It is one degree less in the Sleeping State than when awake.

Why is an animal body warmer than other Substances in the same atmosphere?

I shall here glance at the several theories broached for the purpose of explaining Animal Heat, and 1st of Dr Stevenson's (Edinburg Med: Essays) which attributes this Phenomenon to a fermentation of the

Blood

Blood, and this too of a putrefactive kind. Several reasons concur to render this theory inadmissible.

1st It cannot be proven that fermentation does take place in the blood, & the supposition is purely hypothetical.

2d Because the animal body must be dead before putrefaction can take place within its substance. In the bile, sweat & feces this process does go on, but these are to be considered as extraneous substances.

3d No heat is generated in putrefaction, & putrefaction is the only fermentation which animal matter undergoes. No heat, for instance is generated in the putrefaction of a whale on the sea shore. The vinous state of fermentation is the only one wh generates or evolves heat, & this cannot take place in the blood.

4th If animal heat depended on putrefaction we shd find large animals warmer than small ones for in proportion to the quantity of matter would be the evolution of heat — yet this is not the case. An Elephant & a Mouse are of the same temperature.

A Second Hypothesis is that it is owing to the "friction of the fluids against the solids of the body" — Many reasons compel us to lay this aside also.

1st Heat is only produced by bodies whose surfaces are unequal; you can never produce heat by agitating

Water

Water in a glass phial.

2d For the production of heat by friction, it is necessary that one part be fixed. A rope acquires no heat by passing thro' a pulley. Now both the vessels & blood move continually.

3d The motion of the blood is so slow at any distance from the source of circulation, that it is insufficient to explain the heat.

A Third Hypothesis is that it is owing to the motion of the different parts of the blood on each other. This cannot be the cause, for mercury & water might be agitated in a vial to all eternity, and no heat would be generated.

All these Theories lead to one adopted by Dr Black viz The Decomposition of pure air in the Lungs. He supposes that heat is extricated by the disengagement of Phlogiston from the blood. Mr Lavoisier and other Chymists have called in question the existence of Phlogiston. Mr Lavoisier & the chymists of France say that the air of the atmosphere consists of pure air (or Dephlogisticated) and azotic air (or Phlogisticated) in the proportion of 1/3 of the former to 2/3 of the latter. The pure air of the atmosphere consists of a certain base called Oxygen & Calorie, or the matter of heat & fire.

In the

In the process of respiration as in combustion, the pure air is supposed to be decomposed in the Lungs, its base unites with the blood while its heat is set at liberty. The residue of the air is unfit longer for respiration or combustion, & extinguishes flame, and the life of animals which breathe it.

No creature exists in the universe that does not breathe. It is so necessary for birds, that but in their rapid flight they should not be able to breathe they are furnished with cells or reservoirs for air all over their bodies.

Fishes have also need of air. If water be deprived of its air by boiling, fishes are able to live in it no longer.

Insects have so great a necessity for air that their bodies are covered with Trachea, if these are stopped by placing the insect in oil or mucilage, they are suffocated and die. Worms also which live in the earth have need of air, and the Snails wh. shut themselves up so carefully in their shells are often obliged to perforate them for the admission of air, if by any accident the original aperture become closed. Even Toads which have been found in the center of rocks or trees have need of air & respiration. Subsisting on the air admitted thro'

the

the pores of the tree or rock —

Fishes are 2 degrees hotter than the water surrounding them.

Polypi which appear to be intermiade between animals & vegetables, do not expire phlogisticated air as animals do, but like vegetables they inspire azotic & expire pure air &c

Here the great economy of the Creator is visible in a remarkable degree. Animals inspire pure air, & expire azotic; Vegetables on the other hand inspire azotic & expire pure air. In this manner the two kingdoms mutually assist each other and nothing is lost.

I will now give you my own Theory.

1st All bodies contain Caloric in some measure.

2d Many of these bodies increase heat by friction.

3d Different inanimate bodies possess different degrees of heat. This being admitted, I infer

4th That animalized bodies contain a quantity of caloric wh. when acted on by friction, produces heat, as stimuli acting on them —

Animal heat is the product of Stimuli acting on the latent Caloric of bodies.

The decomposition is influential in producing animal heat

We find the heat of the body lessened by purging by wh.

we

we abstract Stimuli. The back of the head is warm in the fit of an intermittent. This is owing to the Stimuli of the Senses.

The abstraction of one stimulus increases the powers of the remaining Stimuli in producing animal heat.

Bleeding, Purging, &c have a tendency to prevent the influence of solar heat on the Skin.

The hands of the Bramins are always cold, they live on vegetable diet.

Uses of animal heat

1st To preserve the fluidity of the blood
2d To give sensibility to the nerves & irritability to the Arteries.
3d To render the Senses more acute
4th To promote the solution of bloods in the stomach.

Motion

This is divided into Voluntary or such as is performed by the agency of the will. Involuntary such as is unconnected with the will as is the action of the Heart Arteries &c and mixed which partakes of both as respiration which tho we are able to suspend, yet we cannot do it long this is the only example of mixed motion.

Physiologists have been much puzzled to account

account for the origin of involuntary motions. The learned Dr Berkeley supposes a child at birth performs the actions of respiration and the actions of the heart voluntarily and from habit we acquire the custom till we are unable to quit it at pleasure. Several reasons force me to reject this theory. 1st Because it is purely hypothetical 2nd Because there are many instances of children being born in whom the heart acted & who had no brains and of course no mind for mind could not exist without brains.

3d The involuntary motions are accompanied with no fatigue which is not the case with ~~in~~voluntary motions

Animal life shews how involuntary motions are formed, to wit: by force or in other words by stimuli. I came here observed the doctor, apparently voluntarily, but the air in the street stimulated my lungs, the lungs my heart, this sent a quantity of blood to my head, the blood stimulated my mind this excited a susceptibility of impressions, my sense of duty stimulated the will, this the muscles, and they under this chain of stimuli conducted me here. No actions of the body are originally voluntary, they all become so by habit.

Actions at first ~~in~~voluntary afterwards become <u>involuntary</u>; for instance in a child the motions of walking is <u>voluntary</u>; but in the adult it becomes by habit <u>involuntary</u>; but in old people it again becomes partially voluntary

Dr Cheyne mentions the case of Colonel Townsend who could suspend

suspends the action of his heart and appears dead for a considerable time and then get up without any inconvenience. But he does this I am persuaded by the intermedium of the respiration, this he suspends and the action of the heart ceases of course

Nature certainly did very wisely in making the action of the heart and vessels be out of our own reach. The influence of the will would have been suspended in sleep and of course these actions would have ceased had they depended on the influence of the will

We have been looking within instead of without for for the production of muscular motion. I came to this day by force.

Voluntary motions are explained in the same manner. The will has no power in producing motion without external stimuli. The brain & the mind excite a susceptibility of impressions & the will moves the muscles of the limbs.

On Respiration

When we view the human body in a quiescent state, we view with admiration the alternate rising and falling or dilatation & contraction of the chest produced by respiration

This process is divided into two parts Inspiration and expiration. The lungs the organs by which respiration is performed are sparingly supplied with nerves, these come from the recurrent, Cardiac Plexus &c &c

The lungs possess very little sensibility. The Bronchia or ramifications possess most, several facts prove the former to be the

the case

1st Wounds made into the substance of the lungs give very little or no pain

2d From some experiments made by Dr Munroe on the parts in their natural state. He says however that they are irritable and may be compared to a tooth wh in the sound state is insensible but when inflamed is so tender that it cannot even bear the pressure of the tongue. The organs of motion then are possessed of irritability, the organs of sens sensibility. The irritability of the lungs then is much increased by disease and yet it is so small that I never heard a patient complain of pain in the lungs. It is a kind of oppression or weakness not absolutely painful. Here we must admire the wisdom of the divine architect in giving this irritability to the Lungs

The Causes of Respiration are

1st An uneasy sensation in the breast wh is owing to a stoppage of the circulation in the small vessels of the lungs & wh renders it necessary to repeat the inspiration very frequently. Some persons from habit are able to refrain from breathing perhaps an hour as in Divers

2d The Dephlogisticated air which acts by its own stimulus and also the stimulus of the azot left after the absorption of the pure air stimulating to its own expulsion

The Uses of Respiration are

1st To admit air into the lungs by this first movement heat, motion sensation and thought were excited in the progenitors of the human

race. The lungs act like a pair of bellows

2d By the admission of air it imparts a sense of heat.

3d The oxygen gives a red colour to the blood and also unites in part to it

4th Air received into the lungs increases the irritability of the muscles and renders more acute the organs of sense

5th Respiration conveys moisture to the lungs and thereby to the whole system

6th It conveys offensive matters out of the body as azotic gas, carbonic acid gas, and water 4/5 more being discharged than received. The matter discharged has been the subject of much speculation

7th Respiration by the motion which it gives to the adjoining parts assists to propel the blood thro. the minute vessels of the abdomen & other parts of the body & also thro the liver spleen & the different viscera

8th It increases the sensibility of the gall bladder & ducts, the ducts of the pancreas kidneys &c and assists them to discharge their contents

9th It assists in ~~producing~~ expelling the fœtus in utero, and in discharging the contents of the abdominal viscera

10th Swelling is performed only by the aid of inspiration

11th In children it is absolutely necessary for sucking which depends almost entirely on the muscles of respiration

12 For the formation of the voice. By respiration only can we enjoy the pleasures of vocal music and conversation

Respiration is carried on differently in the two sexes. The male uses the diaphragm & muscles of the abdomen more than the female Females breathe more by the elevation of the ribs and breast. This observation will enable you to distinguish the sexes of children

Our next subject is the effects of respiration, if I may so term, Coughing, Sneezing – Yawning – Panting, Hiccough, Laughing & Crying

1st Coughing This action is excited by a collection of mucus in the trachea, or in its ramifications in the lungs, wh forms an obstruction to the passage of air thro the lungs. Also by its pressure on the blood vessels, obstructing the pulmonary circulation. It consists of an inspiration followed by a quick and forcible expiration. The abdominal muscles and the diaphragm always act in coughing. Coughing comes on naturally in the decline of life, hence the tussis senilis as the Nosologists call it. It is so common to old people, that an old man is never introduced on the stage without it. It is by no means the cause of Phthisis Pulmonalis. It is a mode wh nature uses in disease to prevent death, by getting rid of an obstruction in the lungs

2 Sneezing. This like coughing consists of a deep inspiration followed by a sudden and violent expiration thro the nose and mouth. It is excited by irritation of the membrane of the nose as by stagnated mucus, odours &c and its use is to expel the irritant

Sneezing occurs as the premonitory symptom of Catarrh. It also occurs in the crisis of some febrile diseases and is then always favourable as the patient generally begins to recover from the time of its occurrence

3 Yawning This is a slow full inspiration succeeded by an expiration rather more forcible than the inspiration. It is accompanied with a gaping as it is called or wide opening of the Mouth

Its use is to accelerate the motion of the blood thro' the Lungs. It occurs most frequently when we are fatigued, as in the Evening also in the morning just after we are awake – its use then is to equalize excitement if accompanied with a motion of the limbs —

4th Panting Consists of quickly repeated inspirations & expirations It tends to increase the rapidity of the circulation in the Lungs and to supply them with a greater quantity of Oxygen. It occurs after violent exercise as running, jumping &c: and also in some diseases of the breast —

5th Laughing consists of a deep full inspiration, succeeded by imperfect frequent and quick expirations. Laughter when moderate conduces to health it occurs most frequently in the evening after the business and fatigue of the day. Hence sensible men of all ages have devoted the evening to festive mirth

6th Hiccup This is a violent and deep inspiration depending on a convulsive motion of the diaphragm and accompanied with a peculiar noise. It occurs frequently after laughing and serves to remove the debility induced by it. It is a dangerous symptom in many diseases

7th Crying consists of one deep inspiration succeeded by frequently alternated expirations and inspirations, terminated by one full inspiration. Crying is of great use to us in either excess of joy or grief. In the former it prevents the indirect debility wh wd otherwise ensue, and in the latter the direct by promoting the languid circulation. Crying is generally attended by a discharge of tears from the eyes. There is an old saying "Laugh and be fat" but from my own observations I believe it possible for a child to cry and be fat as well as to laugh and be fat

x May it not be a compound of both

Having surveyed these offices of respiration our next subject is

Voice and Speech The anatomy of the parts concerned you will hear from the anatomical chair, I shall therefore not dwell on it but pass to the Physiology. Physiology is to anatomy what Philosophy is to natural history

The parts concerned in the formation of sound wh we denominate voice are the Trachea Larynx Glottis & Uvula, The use of the ~~glottis~~ Epiglottis is to cover the glottis when food is swallowed

According to Dr Munroe the voice is produced by the tremors of the cartilages of the larynx Trachea &c as by those of any solid body, because these tremors may be communicated by a dense substance as metal &c in such a manner that deaf people can hear them

The question whether sound is produced as from a chorded or wind instrument has been much discussed by Physiologists. I believe that it is produced as from the latter and <u>not</u> the former

1st Because the string of a violin only wants a stroke of some body to produce sound. A stroke however on the tense cartilages of the glottis does not produce any sound

2d If the lungs of a dead animal be inflated and the air made to pass from them by compression, sound very similar to that of a living body is emitted. Now in the dead body no tension of the cartilages exists wh can explain this effect

3d If it be owing to the tension of the cartilages of the larynx, how is it that this tension being destroyed by a division of the larynx, yet sound will be emitted. Mr Fox dissected out the larynx of a pig and upon the parts healing the ~~pig~~ ~~sound~~ pig emitted its accustomed tone

1

4th In corded instruments the more tense the chordæ the more acute are the sounds, now the cartilages of the larynx of men are certainly harder firmer and tenser than those of women, yet it is universally known to be the case that the voices of women are more acute than of men. The Uvula contributes much to sound, its loss is followed by great alteration in the voice & yet the uvula so far from being tense is very soft

5th In blowing the nose, the noise is proportioned to the greater or less velocity with wh air passes thro the nostrils. This cannot be explained on the supposition of a corded instrument.

6th The resemblance between the organs of speech and a wind instrument, affords a strong presumption that sound is produced in both upon the same principle. Is sound increased by the greater velocity of the air, so is the voice, — Is sound increased by great irregularities of surface, so is the voice by the lips, teeth, tongue, palate &c Is sound more acute by the narrowness of the aperture? so is the voice by narrowing the aperture of the glottis, mouth &c

7th The voice like wind instruments produces Echo, chorded instruments has not this effect

8 A disease of the frontal sinuses renders the voice hoarse and unpleasant, in consequence of matter collecting in them, when this is discharged an alteration in the voice is produced that is it returns to its natural state, wh circumstance cannot possibly have any connection with the tension of the cartilages of the larynx

Mr Dodart computes that there are 9632 vibrations of the glottis in a minute in some sounds, this number will appear incredible till we recollect with what accuracy musicians will detect a

a deficiency or superabundance of these vibrations in a peice of music

Sounds are either acute or grave, strong or weak. The acuteness of sounds depends upon a straightning of the glottis. If we endeavour to render sound very acute, or very grave, the voice is lost. In the first place it depends upon the shutting up of the glottis & in the second on its too great width. Strength or Weakness of sounds depend upon the greater or less quantity of air expelled & perhaps also on the action and position of the mouth tongue &c. The teeth may perhaps have an influence on it and hence it is that very young and very old people have much weaker voices than Adults

Whispering This is when the air is not expelled from the lungs with force sufficient to excite tremors on the glottis. If you lay your hand on the head of a person who whispers you will feel no tremor, but if you place it on the head of a person who speaks loud, you will perceive very evidently a tremulous motion of the head.

Singing This is a particular modulation of the voice by wh the sounds are protracted. The trachea is shortened or elongated in proportion to the length of the tones. The tremors produced by singing pervade the whole body. The voice undergoes a great change at the age of puberty, the voce rauca or breaking of the voice happening at this time of life from an increase of the strength of the Larynx

The passions have great influence on the voice, thus it is soft in love quick and fierce in anger, humble and slow in supplication &c &c

Many other circumstances have great influence on the voice. Country is a principal one, Americans and Europeans may be distinguished by their tone of voice it is not exactly alike in any two States in the Union

Shelhammer relates the case of a boy, who by being bred among swine acquired a habit of speaking very much like their grunting.

If the recurrent nerve be divided, the voice is destroyed. Paralysis of this nerve produces either aphonia or paraphonia, the first an entire loss of speech, the latter a partial loss of it

The modifications of the voice depend on the size of the trachea & glottis, it is lower when standing than sitting and is weakened by eating a full meal

The thyroid gland is a grand provision for preventing the trachea from bursting when we hollow

Speech gives man a rank above all other animals. Voice and reason are possessed by many animals in some degree at least, but in speech he is blessed above them all. I do not call the words wh some birds are taught to pronounce speech they are as truly mechanical as the sound from a violin or bagpipe

1st There can be no speech when respiration is not voluntary

2d If the larynx be above the glottis, there will be voice but not speech if below the glottis there will be no speech nor voice

speech is wholly imitation, children acquire it in the first 15 or 18 months of their lives and many do not acquire it till a much later period I have known three instances where it was not acquired till the eighth year. – Speech begins at the glottis and extends to the tongue and ~~ends of the fingers~~ lips. The first use of the larynx is in crying, this tho it is a sign is intended by nature to prepare the organs of speech for use, the muscles of speech are

supplied in this manner and rendered fit for the actions which they afterwards perform

3 Laughing is the next means employed for the formation of the voice no animal but man either laughs or cries, tho some express pain by other means or by tears. This singular attribute of man is perhaps only because they are necessary to the formation of his voice

4th The next noise of an infant is Crowing, this is a slow expulsion of air from the lungs and some action of the glottis attended with a guttural noise, the sound is Whu Whu a joyful one to mothers. At the 7th or 8th month the child begins to use his tongue and Dad, Dad Dad is the first salutation to his father — The lips are next used and at about the 9th or 10th month Pap, Mam are first pronounced. It is worthy of remark that in all languages labial and lingual letters are used to begin the words Father and Mother, as Pappa Mamma (Eng lish) Père Mère (French) Pader Mader (Spanish) &c &c —

Thus the first 18 months of a childs life may be supposed to be spent in the preperation of the organs of speech for that office. By this time the growth of the teeth has progressed considerally, and they are now capable of assisting in the pronunciation of words

In the pronunciation of words the eyes are of great of service, by observing the motions of the lips of persons who speak to them

Nouns or Substances are the first words wh children generally learn some of these they acquire with great facility. In this state they shd be made to repeat words over several times, for if they loose the mode of expressing a thing they its proper name, they seldom

then acquire it for months, unless by accident they hear it pronounced or are corrected when they miscall it. thus a child who acquired the pronunciation of "potatoe not being made to repeat it. forgot it for three months, another child called a "chariot" "Paw" and sugar "Pilly" for 6 months after it had learned to speak; had the first child been made to repeat "Potatoe" 5 or 6 times it wd never have forgotten it and had the parents of the other usured to understand what it meant by "Paw" and "Pilly" it wd probably have found out the the proper names for chariot & sugar

An ignorance of the proper method of using the tongue and muscles concerned in speech is the great source of inability in children to speak plain. If they grow up in the habit of speaking wrong, they can seldom correct it, very few Foreigners are able to acquire the true English pronunciation of th" as it occurs in this, that, there, &c had they when young heard it pronounced, probably they wd have learned its proper pronunciation

Proper rules for the motion of the lips and tongue are of service in learning to pronounce particular words. I instructed a child to pronounce V by directing him to place his upper fore teeth upon his lower lip, to make a forcible expiration & at the same moment to seperate his teeth and lips - giving it the E sound per Va Ve would be pronounced with pleasure, the child has since pronounced it with ease

Different languages require the use of different muscles & parts of the organs of speech, some Languages consist of many more vowels than others as the Italian. Some are remarkable for guttural sounds, it arises probably from indolence as they require very little motion of the

tongue and lips, hence the few words among the Indians. The Indians give their consent to any thing with a kind of grunt

The Italians use the Uvula, Teeth and Fauces very much. The Hebrew language consists principally of palatine and nasal sounds. Since speech has been pretty well understood, successful attempts have been made to teach the dumb to speak, Mr who was engaged in an employment of this kind, used the following method when he wished his scholars to pronounce "paper" he directed them to place the under and upper lips in contact, to make an expiration at the same time that they opened their lips and to give it the sound "pä" for the second syllable he gave the same directions as above, only to bring the teeth after the p was sounded so as to give the r sound this would be "pir"

The motions of the lips are of great consequence, some people can hear with their eyes by carefully observing those motions. Haw Boe=have nephew to the celebrated Dr Boerhaave was said to hear by the tremors which he felt in his hands and feet. This was a translation of sense to these parts

Ventriloquists differ only from the common mode of talking, by forming sounds during inspiration instead of expiration

We can have some idea of what an immense number of motions the glottis and muscles of speech are capable, by considering that the English Language alone contains 40.000 words each of which require a different motion of these organs, and that there are many persons who speak all the ancient and many of the modern languages

The Uses of Speech are many. It raises man above all the creatures of the earth. By it sages were enabled to teach children before the art of writing was ~~invented~~. It enables us to get thro the business of life with ease. It affords us one of the sublimest gratifications of wh the human mind is capable, conversation. It is the vehicle of eloquence, friendship, love &c and it enables us to address the Great Father of the universe

Where there are few words there can be but few ideas. Man's prerogative is said to depend on his reason. I believe that Adam spoke immediately after he breathed, as much as I do that he walked our ~~fore~~fathers are to us what the Supreme Being was to Adam. The only difference is that we require 10 months to learn to speak whereas Adam spoke immediately after his creation.

Circulation of the Blood

In prosecuting this subject I shall speak

1st Of the Course of the blood after it has gone thro the action of the lungs

2 Of the Peculiarities of the Heart & Vessels which circulate the blood

3 Of the Powers which move the blood

4th Of the principal uses and advantages of the Circulation

Course of the Blood

The blood after going thro the lungs returns by the pulmonary veins to the left auricle of the heart, from the left auricle it goes into the left ventricle, from that thro the aorta to be diffused in every part of the system. it then returns by the smaller veins into the vena cava ascendens & the vena cava descendens from them it gets into the right auricle then into the right ventricle wh throws it thro the pulmonary artery into the lungs it then takes the same course over again

The chyle enters and is mixed with the blood in the left subclavian vein and returns from thence into the ocean of blood the heart where it is mixed and incorporated with the general mass

That the above is the true course of the blood I infer

1st From the different phenomena of hemorrhages as they occur in different parts of the body

2 From the structure of the valves of the heart wh are calculated only for the motion of the circulation as described

3d From the valves of the veins allowing motion only one way

4th From ligatures made on the extremities as in bj here the veins swell below the ligature and the arteries above it

5th From the injections of the arteries and veins and microscopical observations

6th From the effects of a ligature on the vena cava & aorta. at first the vein swells at the part farthest distant from the heart and the aorta at the part nearest the heart

7th From the phenomena of transfusion. By this the blood of the arteries of one animal is made to circulate thro the veins of another, previously deprived of blood, with vigour and regularity

Peculiarities of the Vessels for Circulating the Blood

1st The Heart. the position of the heart you all know is within the cavity of the thorax wh serves as a bony case on every side

2 The Pericardium wh surrounds it is designed to prevent its coming in contact with the other contents of the thorax which might impede its motion and it also serves by its vapour to keep the heart moist

3 The heart is supplied with blood from the Coronary arteries & with veins from the cardiac plexus

4th It possesses great sensibility & irritability greater by far than any other muscle. It may be excited into action immediately after death by water, air, an electrical spark, by vapour, by heat &c in short by any stimulus. Its cavity is more irritable than its external surface, its sensibility is less than its irritability. The heart is more irritable in old than in young animals

5th The number of its contractions is about 3000 in an hour & this without an interval of rest in the longest life. The right ventricle beats longer than the left by several strokes. Dr Ramsay informed me that the left ventricle was larger in americans than in Europeans

The Arteries have three coats an external a middle muscular and an internal polished membranous one. Hunter and Haller say the arteries do not possess excitability. I shall endeavour to prove in a subsequent part

of my lectures that they do possess this and I shall quote a passage from Haller where he even confesses it

It is the distention of the arteries that forms the pulse, the heart & arteries have synchronous motions

The arteries possess nerves and blood vessels as other parts of the body Their blood vessels are called vasa vasorum

The Arteries possess great elasticity and strength, this is more remarkable in proportion to their distance from the heart, Mr Wintering-ham has proved that 150th weight to be necessary to break some of them I say the more elasticity and strength the farther from the heart, this is because the substance of the small arteries is greater in proportion to the bore, or capacity of the arteries than the larger ones

The Arteries generally ramify at acute angles tho there are many exceptions, this is to supply the blood when one of the arteries is obstructed by the anastomosing branches, as in the case of aneurism in the extremities aneurisms occur oftenest near the heart, the arteries are strongest at a curvature it is here that ossification frequently occurs

Veins

The veins have a muscular coat as well as the arteries, the muscular fibres can be easily distinguished in some of the large vessels near the heart. The veins having less occasion for strength are not so strong as the arteries. —— For besides one principal vein wh accompanies the arterial trunk there are superficial veins on the surface of the body, about the extremities & sometimes in the forehead, Veins have one remarkable peculiarity, the valves wh are situated in almost every part of them, Veins are more numerous than arteries, they are kindly provided to return the blood to

the heart. It seems as the bloodletting had been contemplated in the formation of man from many of the veins being so superficial. They contain more blood than the arteries a, 4 to 4 this is the reason why congestions are most common in veins

The heart possesses in itself the power of motion, the distention of it by the blood is the stimulus wh excites its action, & the influence of the brain. The Brain excites motion in the heart & the heart in return excites motion in the brain. Dr Cullen denies this because he supposes from habit it wd loose its power of stimulating, but he might with equal propriety expect the stomach to be insensible to the stimulus of the food from long habit. That the brain has an influence on the heart is proved by the phenomena wh occur in diseases of the cardiac nerve

The heart contracts from the stimulus of oxygenated blood, according to Dr Goodwin, the contraction of the left ventricle can be only thus accounted for, for the right contracts without this stimulus, his experiments to prove this no accuracy can be expected for the pain wh animals suffer in the experiment has great influence on the action of the heart

The heart at times pulsates so strongly that it may be heard all over a room, Mr — quotes cases in which the bed clothes of patients have been seen to rise and fall according to its pulsations. — In these cases the action of the heart must have been convulsive or morbid

The Powers which move the blood in the arteries are

1st The hearts action, the heart is kept in action by the stimulus of distention, it is kept up by the action of the brain

2 The specific stimulus of the blood

3 The stimulus of pure air in the blood

4th The irritability of the arteries, this Dr Haller denies, but in his chapter on arteries he indirectly asserts it. This irritability of the arteries is the cause of their action, when the heart cannot act, if for example you place one leg over the other in such a way, as to press upon the popliteal artery, the foot will move with every stroke of the artery, now here the force of the heart cannot act, it must proceed from irritability in the muscular fibres of the artery itself which are excited into action by the blood

5th The quantity of blood in the body has an influence on the circulation it is supposed that about 20th of blood are contained in men in health. The immortal Harvey was so certain of the action of the arteries that he called them the "primum vivens et ultimum moriens" of the body

The stomach digests food, the lungs furnish air, the nerves possess sensation, the lymphatics absorb, all for the benefit of the arteries. The stomach, glands, viscera &c are all formed for their existence and service, a pulse has been felt when there was no blood in the vessels, The arteries move the blood independant of the action of the heart

Dr Barlow has proved from experiment, the excitability of the arteries this doctrine forms a principal part of my theory of medicine. The blood vessels are the centinels to guard the system in the sleeping state, the other functions of the body cease, but the action of the arteries never does

Powers which move the blood in the veins

1st The pressure of contiguous muscular parts

2d The pressure of certain abdominal viscera and the Diaphragm made indirectly by the abdominal muscles, and also the contiguity of the arteries whose pulsation quickens the motion of the blood in the veins, one of wh as we before said generally accompanies the other

3 Respiration

4th A peculiar irritability in the arteries wh 5th Dr Cashow and Haller have proved also to exist in the veins

6th The mixture of the lymp and chyle with the blood, this acts by rendering the blood less viscid than before

7th In small veins, from inflammation following venesection, in addition to these causes, the influx of venous blood during sleep

Uses of the Circulation of the blood

1st To excite the action of the brain wh ceases so soon as the circlr has stopt

2d To distribute heat to the different parts of the body

3 To distribute a certain degree of moisture to the body

4th To afford the fluid from wh all the secretions are made

5 To convey nourishment to the body, and prevent its decay

6th To impart sensibility and irritability to the system

7th By supplying a nervous fluid to the different parts of the body, by the friction of the blood against the sides of the vessels

Great revolutions have taken place in the opinions respecting the arteries it is since that time that they have been discovrd to carry red blood, we find authors in ancient works describing the heart as consisting of bone covered with hair

I cannot quit this subject without paying a tribute of gratitude to the immortal Harvey the discoverer of the circulation of the blood. This celebrated character derived no assistance from his predecessors or Cotemporaries but like an Eclection perse he derived nothing from the collision of his opponents, all his discoveries were his own, the discovery of the circulation is one of the greatest with wh Physicians have been enriched but I look forward to the time, when we shall be as certainly acquainted with the mysteries of the ~~circulation~~ brain and mind as we now are with the circulation of the blood

Discoveries will not cease in Anatomy and Physiology any more than in Navigation, while there is any Terra Incognita in the animal body

Let us view the effects of the blood on the brain. The brain nerves and muscles are all connected, they all possess specific actions. We observe thought without sensation or motion, motion without sensation or thought &c

Nervous System

On this subject physiology is nearly silent, to posterity I commit the discovery

In the nervous system I include, Brain, Muscles, Tendons, Nerves and Mind. The origin of the nerves is the brain cerebellum, and medulla oblongata

In treating of the nervous system, I shall begin with the brain. The arteries wh carry blood to the brain are more elastic than elsewhere, Haller says one tenth of the blood in the body is sent to the brain, the blood in the brain moves it, by this in turn the heart is moved, no Lymphatics have yet been discovered in the brain, It has various motions 1st From the pulsations of the arteries 2d from every act of respiration 3d a German Anatomist says that motion, like muscular action takes place in the brain

It is said by some, that the nerves of voluntary motion, arise from the cerebrum, those of the involuntary from the cerebellum. This I believe is without foundation. It is worthy of remark that 4 out of 5 senses are within an inch of the brain. From these two facts, the origin of the nerves and the situation of the organs of sense being placed near the Brain, I infer that the brain is the seat of the mind 3d I infer it from the quantity of Blood spent upon the Brain 10 according to Haller and 1/5 according to Munro of the blood of the whole body

4th

5 The Fabric of the Brain appears to be glandular, secreting a fluid of thinner consistence, than that of the brain

6th The veins of the Brain differ from those of the other parts, in being void of valves till they make their exit from the skull

7th There are no Lymphatics in the Brain

8 Man has more brain than animals wh have no mind, and the quantity of the Brain, appears proportioned to the strength of mind in man &c

We have said that man has most Brain. Dr Monroe to prove this weighed the Brain of an ox and that of a man, and found the man to have 6 times as much as an ox, so that in proportion to their sizes the ox had the 36th part as much as the man

The Nerves are composed of whitish cords, they arise as we before said from the Brain &c and ramify all over the body, or I wd rather say that they commence in all parts of the body and terminate in the Brain as Drs Valli and Fowler have asserted

They contain a medullary substance similar to that of the brain and like the arteries more of them are distributed to the muscles and skin than to the bones viscera &c This is because sensation and motion are of more consequence to the former than to the latter. Dr Darwin thinks they contain fibres, all sensation is conveyed from them to the mind. They do not appear to communicate like bloodvessels, the Branches of the nerve are generally sent off at ~~acute~~ angles tho sometimes at right angles. They are smaller in man than in other animals, the smaller the nerve the more acute the sensation, the nerves of a horse are ten times larger than those of a man, The nerves are said to be covered by a continuation of the pia mater

The Nerves have every where ganglions at certain distances from each other these Dr Darwin supposes are little branches as it were in wt a new supply of nervous juice is generated, for the nerves are supposed to convey sensation, by the means of a certain fluid contained within them

Most of the Ganglions are observable near the heart
The fluid Dr Cullen denominates Ether, the nerves its conductors

Many have supposed the nervous fluid, to be the electric fluid and some experiments of Galvani and several others, have given an appearance of plausibility to this opinion. But I doubt this very much the phenomena of Electricity are very evidently different from those of the Electroid fluid as I have called it (a fluid somewhat resembling the Electric) It differs from the Electric fluid

1st It exists in an accumulated state in the nerves at the same time that a conductor is applied to them this wd not be the case with the Electric fluid, it wd fly off

2 It differs from the Electric fluid in the nature of its conductors, Charcoal wh is one of the most powerful conductors of the Electroid fluid is a non conductor of Electricity

3 The Electric fluid stimulates plants to growth the Electroid has no such power

4th The former disposes to putrefaction, the latter resists it

5th If a spark of Electricity be applied to the tongue, it gives pain without any particular sensation, whereas the Electroid has evidently a saline taste, the Electric smells like phosphorus, the Electroid has no odour

The shock of the Torpedo is proved by Dr Fowler to be different from the electric shock. Dr Fowler proves that the Electroid fluid is increased in inflamed parts, that nervous diseases may probably be explained from this source and that sensation itself depends on the Electroid fluid in aqua arthritica and sounds in the head

As the nerves are the organs of sensation, the Brain of thought, so are the muscles the organs of motion

The nerves are not the same substance as the brain, but connected merely by juxta positio, muscles are not continuations and expansion

of nerves. Every muscle becomes shorter and wider when it contracts

The Stomach Liver & Spleen have less sensibility than might be expected from their quantity of nerves. the testicles have great sensibility and few nerves. The nerves of organs wh act involuntarily have most irritability. the reason why the viscera do not possess great sensibility is, because it wd be injurious, owing to their internal situation where they cannot easily be relieved

Nerves are differently modified for the various senses. the tongue possesses great sensual sensibility, but very little common sensibility it is wounded without giving great pain. some have thought there were different nerves for sensation and motion. Dr Fox saw a patient with sensation on one side only, motion of some kind is indispensably necessary to sensation. the can be no thought without some kind of motion, the nerves must possess some kind of motion. sensibility descends in amphibious animals. Digestion and secretion cannot go on without nerves. Nerves when cut unite more slowly than muscles

I have said they were instruments of sensation the question is how do the communicate sensation to the Brain? Haller says that all parts do not possess sensibility but this I deny, all parts have sensibility under peculiar forms & modifications. Dr Whytt

A drop of opium has paralysed a nerve the same nerve recovers itself the skin in certain fevers looses its sensibility to cantharides and fire itself, yet nerves must exist there, Patients in the Hospital had their feet burned without sensation of pain. Ligaments tho insensible in health possess sensibility in disease, the same remark applies to the bones. The

The Uterus is exquisitely sensible in the nerves, not so in the intervals the teeth are sensible to the action of cold, but not to fire. Certain impressions when gradually applied give no pain, but when suddenly applied, cause much pain and even death

Sensation

Sensations are either simple or reflex, simple sensations are the mere knowledge that impressions are made, the reflex are such as convey an idea to the mind of the quality or nature of the impression. Sensations are agreeable, pleasureable delightful, or on the other hand, disagreeable, unpleasant or painful The sensation from a fine prospect is agreeable that from a glass or two of wine or ~~from~~ opium in such quantities as to exhilirate the spirits pleasureable and the delightful from sensual gratifications. The Disagreeable in viewing a disagreeable object. the unpleasant occur from low spirits or nervous affections The painful from a surgical operation, burns &c &c

Are there any sensations unaccompanied with pleasure or pain? I think not. A fine prospect affords agreeable sensations, while sensual gratifications afford sensations called sensual

Impressions are not always accompanied with sensations. The operation of a diuretic medicine is attended with no sensation, a purge must produce motion, yet if it does not gripe there is no sensation produced

Impressions do not always produce sensations, in the part to wh they are applied. stone in one kidney often produces pain in the other a stone in the bladder produces sickness at the stomach

There is no proportion between sensation and the stimuli producing it
Sensations very seldom inform us of the ~~stimuli~~ impressions producing them as the sight of colours never gives us a hint that it depends on the refraction of light Sound also

It is the will of the creator that certain impressions on the nerves shall excite ideas in the mind, the same in all persons & at all times in the same person when in the same degree

Laws of Sensation

1st All sensations are proportionate to the force of impressions & to the excitability of the part to which it is applied

2d The force being given, sensation is proportionate to the duration of the impression

3d Only one sensation can exist at the same time. Take notice of this gentlemen it is of the utmost consequence. If for example I pull a hair out of a persons head & at the same time strike him a blow on the part the sensation wh ie otherwise have been made by plucking out the hair, is lost in the more forcible one of the blow, for the most forcible stimulus excites the sensation. If you give a dog a dose of nux vomica and then a severe whipping the Emetic will not operate. The fact will be of the most extensive application in our Therapeutics even Hippocrates observed it

4th A number of impressions of equal force being given the sensation produced is a compound of them all. We see this instanced in music, if a number of musicians play on different instruments the sounds themselves are evidently different yet the unison

gives us the sensation of harmony. Again in colours, if a boy paint a top of different colours and twirl it round, the colours are compounded & gives the Idea of but one. Two thoughts excited in the mind at once one is produced different from either, Two medicines of the same force exhibited at the same time produce a compression a compound of both & we are disappointed in its effects, Or if to the eye be presented Blue and Yellow in the same place, green is excited, for this purpose they must be synchronous. It has been said that Julius Cæsar dictated to 6 amanuenses or clerks at the same time, or had 6 distinct thoughts at the same time; his Ideas were not synchronous, they succeeded each other perhaps rapidly, but certainly they did not exist at the same time. In reading we see the power of habit in accelerating the succession of Ideas in our minds; it is probable that each word or even every letter, conveys a sensation to the brain perfectly distinct but so rapidly succeeded by each other as to give us the ideas of the author. We acquire from reading a habit too of foreseeing as it were the letters and words wh follow each other. Children afford an example of this, when they have been reading words wh begin alike, Printers too fall into the same error placing country for county &c. The quick perceptions wh the mind has a power of conceiving from reading has made it to be called very emphatically the 6th sense

5th Certain sensations continue a long time after the impression wh excited them has been removed, thus persons who have suffered an am

putation feel an itching of the feet an hour after the limb is removed

6th Sensation is destroyed by the impression being disproportioned in force to the sensibility of the part to wh it is applied: This accounts for the want of pain wh is often experienced immediately after the amputation of a limb. A drachm of arsenic destroys the sensibility of the part. And a person who cd hear the sound of a pin pushed thro a peice of paper could not hear the noise of a cannon

7th Feeble sensations often drive away a painful and more powerful one. — As a man curing himself of great pain by shaving. A reigning Epidemic being driven away by the Influenza or Small pox. The system tho must be worn down first for some time

8th Sensations are renewable by repitition Imagination & memory called Idea's

9th They are much influenced by habit.

Effects of habit on Sensation

1st Certain painful sensations become less so by repetition.

2 Certain sensations originally painful become pleasant by repetition. As chewing tobacco and drinking ardent spirits are at first very unpleasant but habit renders them pleasant. This fact obtains in morals as well as in medicine, hence Shakespeare says

"Assume a virtue tho you have it not"

"That monster custom &c

3d Certain sensations originally pleasant, become less so by repetition as the cold bath

4th Certain sensations originally pleasant become painful by repetition, as the continued dropping of water on the head

5 Certain sensations are destroyed by repetition. The pleasures of youth are destroyed in old age by repetition, Opium Jalap &c require to be used in large doses by those who have been accustomed to them The Miasmata in the W. Indies will produce Malignt fevers in new comers and have no effect on the old inhabitants

6th Certain sensations are influenced by different ages in the power of exciting pleasure & pain

7th Sensations arising by comparison become more prompt by repetition & also more acute

8th Ideas are not only renewable by repetition, but there is a certain order established in them ever after, as repeating verses

9th Two or more sensations often excited together are ever after connected in the mind, This is what we call association of Ideas association of Ideas is 1st Natural & 2d Artificial. For an example of the artificial if we hear the first line of a poem wh we have read, it recalls to our recollection the subsequent parts of it.

Muscles & Tendons

Muscles are composed of fibres invested with cellular membrane. The muscular power or substance extends to every part of the body, hence the predisposition to take on Convulsions &

spasm. The Stomach, Bowels, Lungs, Trachea Heart & Brain are all liable to spasmodic diseases. They are provided with veins, nerves, arteries and derive their colour from the Blood. Muscles as some think are not continuations of nerves, they become longer and shorter in acting. The term relaxation is improper, contraction is better

The force of muscular action is influenced by the quantity of blood muscles become paralytic as well from want of blood as from want of nervous influence, There is more strength in muscles than in their tendons. The Tendo Achilles will often break the muscles remaining sound, The extensor muscles are weaker than the flexors

The contractions of muscles is greater than that of any other elastic matter. Hollow muscles are most irritable as the heart intestines &c It is owing to the irritability of the Intestines that fæces are discharged after death

Different parts are acted on by different stimuli; the lungs by air, the heart by blood & stomach by food. Irritability is great in animals in proportion to the weakness of their intellect Irritability in some animals is related to the ~~weakness~~ quantity of muscles, There are 466 in the human body 400 in some animals. It is owing to the smallness of mans muscles that he is weaker than other animals proportionate in size. The force of muscles is increased by wrapping thongs round the limbs it is in this manner that the fascia which cover different muscles are serviceable by supporting the muscles in their action. The Indians have a practice when they are

fatigued of taking up a log of wood and carrying it for some distance in this manner they dispipate their excitability
The action of the will increases muscular strength, the strength of muscles lessen after death
Animals possess the power of reproduction of parts, few parts of the body of man are renewed, but the hair nails, bones &c.
Birds possess the reproducing power in the greatest degree, the Tenia next
Office of muscles Does the power wh moves muscles reside in the brain? There can be no doubt that the brain is the great reservoir of muscular power, yet muscles do act independantly of the brain, Haller says they possess an inherent power or principle of action Galvanism favours this notion
a vis insita exists in certain muscles tho they are tributary to the brain, a tree will have its existence in winter, but if brot into a warm atmosphere will put out leaves, This vis insita is most obvious in animals with least brain, the vis insita is in an inverse ratio with sensibility. Whether this principle be a quality of muscles I know not, some Physiologists suppose it different from the principle of sensation. This is evident that nerves and muscles act by being affected with different stimuli, Irritability is disordered only by the disorganization of muscles. The less the sensibility of muscles the more their irritability, Sensibility ind with life irritability continues for some time after death. The last predominates in infancy and childhood the former in old age it is owing to this want of irritability in the muscles of old people that they are so frequently injured by falls as they do not put out their hands and arms time

enough to break the violence of the fall whereas children do. They are in equal proportions in middle life. Sensibility yeilds to irritability in old age. Thus we are once a man and twice a child; some medicines are said to act on sensibility others on irritability. There is an integrity in the nervous, venous and arterial systems all being necessary to muscles

Laws influencing the action of Muscles

1st There sh be a communication by nerves with the brain
2d A communication with the heart by means of arteries.
3 A communication between the muscles & veins. Boerhaave says that the integrity of muscles and veins is necessary to irritation and health of muscles
4th A muscle sh not be kept long relaxed at once

Influence of habit on muscles

1st The action of muscles by repetition becomes correct, thus a child will in attempting to throw itself on its mothers breast, move in every possible direction but the right one, but by frequently repeating the attempt the action is corrected
2 The tone of the muscles is influenced by repetition, as carrying a heavy load — repetition changes active into passive sympathy, repetition fixes a return of certain motions
3d Repetition of muscular action is followed by an increased facility & celerity in the muscle to perform that action, this is evident in dancing, rope dancers and fiddlers, climbing a mast at sea &c

4th Repetition lessens the frequency and celerity of motions, as medicine in the stomach

5 Repetition increases the strength of the muscles. A man who lifts a calf every day for a certain time, will at length be able to lift an ox. They acquire a dark colour after exercise

6th Motions by repetition become habitual or are associated without necessity. Thus every night when we go to bed we make water or attempt it tho we have just before emptied the bladder this is association of motion

7th Repetition of certain motions together, is followed by a partial inability to perform the motions seperately, thus it is difficult to move the hand in walking, without moving both & in the fingers it is difficult to move them seperately

8th By repetition, the act of respiration may be more and more dispensed with, divers who are accustomed to holding their breath as it is called can stop their respiration for a considerable time without any inconvenience

9th Repetition fixes the period of the return of certain motions, thus we awake at the same hour generally, every morning Hence perhaps the return of many diseases, as the paroxysms of Intermittent fever

10th Certain actions at first voluntary, become by repetition involuntary as winking and as has been thot by some respiration but no evidence exists that respiration was ever commenced voluntarily

I have thus mentioned the effects of habit on motion sensation and thought

Origin of the powers moving the muscles

The motions of muscles are divided into voluntary involuntary and mixed

The first includes Mastication Deglutition speech Locomotion &c
The second the action of the heart & viscera
The third respiration &c This is semivoluntary
Animal life shews how involuntary acts are performed NOT by force or in other words by stimuli. I came here by force altho apparently voluntarily, the air in the street stimulated my lungs, the blood from the lungs stimulated my heart this sent a quantity of blood to my brain which stimulated my mind, this excited a susceptibility of impression, my sense of duty stimulated the will, this the muscles & they under the chain of stimuli conducted me here

The origin of involuntary motion is difficult to understand. I cannot agree with Dr Berkely who supposes respiration at first to be voluntary, nobody has ever discovered the nature of the first act of respiration, There can be no mind without a brain, – no will without a mind

The heart is a continual stranger to repose, we are told of some who can increase the frequency of the pulse, I think this is occasioned by thinking on irritating subjects.
No actions of the body are originally voluntary they all become so by habit. Air is the primum mobile or main spring of life. It is to life what wind is to a ship under sail or a windmill

at work, Motions or actions at first voluntary afterwards become involuntary, This is exemplified in adults and particularly in old people It has been wisely ordered that the action of the heart and lymphatics are not voluntary, or in other words not at our disposal. Suicide wd I suppose be generally accomplished in this way. – They put the will at defiance

We have been looking within instead of without for the production of muscular motion

Respiration appears to have been originaly involuntary. the bowels move involuntarily yet Dr Darwin mentions a case in wh a stool cd be procured at any time by the action of the will There can be no voluntary actions without the aid of the will

Voluntary motions are explained the same way by the ~~assistance of the will~~ application of stimuli. the will has no more power of motion without stimuli than a dead body to raise itself from the grave. In walking the equilibrium of the body is preserved by throwing the arms in a different direction. The Brain and mind excite a susceptibility of impression and the will moves the muscles of the limbs. Strength in volition appears first in the muscles of the back. The arms for some after birth seem convulsed, because they are not governed by the will. Persons reduced to weakness by sickness recover the powers of the will over their muscles by repetition. It maintains that intimate connection between parts by which impressions on one part produce sensations in another – this is called Sympathy

Sympathy

This is not confined to motions & sensations, but extends to Ideas & every planet performs special offices, but each is connected with the other by invariable laws, Every wheel in a clock has a specific office but all its parts are connected, so individual organs perform particular offices but all are connected, perhaps all sympathies were connected with sensation at birth, perhaps the lungs felt acute pain under the first impressions of air. The cessation of pain in the lungs is compared to the solemn silence of those luminous bodies which move round the ball. The sensations of infancy often revive on a sick bed. In describing the sympathies my history of them is taken from the morbid states of the system

Sympathy is of two kinds 1st sympathy of <u>continuity</u> 2 Sympathy of <u>contiguity</u>

By the first we understand an intercommunion of sensation kept up by a similar substance or parts connected together, An instance of continuous sympathy we have between the rectum and stomach e.g. a stool immediately after taking food or drink into the stomach - It is preeminent in the ~~stomach~~ nerves

By sympathy of contiguity we mean that species of sympathy which is produced by no connection or communication & in parts of dissimilar structure and matter, It is carried on by means of nerves. An instance of contiguous sympathy we have in the stomach and skin, bladder and rectum, Thus a draught

of cold water taken into the stomach will increase perspiration & under certain states of it a contraction of the skin. Frequent discharges of the urine take place from tenesmus or from inflammation of the rectum, sickness at the stomach from another vomiting. Refer to Dr Whytt on nervous diseases

Continuous Sympathy has been divided into Reciprocal Non Reciprocal and Inverse Sympathy

Reciprocal Sympathy is exemplified by the sympathy between the stomach and brain or head — as Hydrocephalus internus from worms in the stomach & sickness at stomach from affections of the brain

Non Reciprocal by the sympathy between the stomach and kidnies The kidnies can affect the stomach but the stomach cannot affect the kidnies

Inverse Sympathy is seen between the lungs and capillary vessels thus pleurisy from suppressed perspiration, — Effects are different in an inverse ratio

The contraction of the skin by the application of cold water is cutaneous sympathy

Delusive Sympathy is when pain is felt remote from the part in wh the impression is made, as pain in the shoulder from diseases of the Liver, Itching of the glans penis from stone in the bladder, this is caused by a continuation of the same membrane

Mixed Sympathies. the Lungs with the feet, stomach with the liver, feet with the head & stomach &c

Sensation in a part remote from the part when the impression

was made is called Error sensus, Motion in a part remote from that in wh the impression was made Error motus

Sympathy of contiguity depends on a communication of substances in different parts of the body contiguous to each other. Diseases of the Uterus & Liver induce colic by contiguous sympathy

The communications of earth, water, air &c by an earthquake is contiguous sympathy

The animal body is the highest grade of matter, a specific stimulus acts upon it. Pain, heat, cold numbness, perhaps belong to both sympathies

Dr Whytt does not admit any sympathy but that wh takes in the sensorium, but he overlooks the objection that all matter is acted upon by stimuli

Principal Sympathies

Motion passes more rapidly in the nervous system, next in the skin, then the bloodvessels Lymphatics &c

1st The Bloodvessels sympathize with each other from the nerves but not from the brain

2 The Brain sympathizes with all the senses, with the stomach producing sickness, with the Liver & spleen, vomiting Bile and obstructions in madness. – with the feet – all the muscles produce head-ache after labour & so wile all the passions of the mind

3d The stomach sympathizes with the Head, with the Nerves, Liver Heart, Kidnies, Lungs, Uterus, Skin Tongue, the whole body, Mind &c

4th The Intestines sympathize with the stomach, feet hence the nausea in Colic. – with the Liver Lungs hence dry cough, with the Limbs Diaphragm Rectum, hence pain on going to stool

5th The Lungs sympathize with the skin genitals &c

6th The Diaphragm sympathizes with the stomach, brain, nose hence sneezing

7th The Eye sympathizes with the ear with the stomach, Pudenda nipples Genitals &c These sympathies are continuous & Contiguous

The Teeth sympathize with the stomach Lungs & whole nervous system

The Bladder with the urethra, palms of the hands and soles of the feet. In old age retention of urine occasions burning in the soles of the feet

The Urethra sympathizes with the testicle & hence swelled testicle

There are some sympathies peculiar to some constitutions, some are formed by accident

Idiosyncrasies Cheese excites nausea in some, convulsions are excited by sounds and sights in others

Remarks

1st Many sympathies are induced by diseases which do not exist in health as Risus Sardonicus

2 Many sympathies of health are suspended by disease, as that between the nose and diaphragm in sneezing. the more violent the disease is the more are the natural sympathies destroyed

3 Sympathies differ in different people

4th They differ in different ages & sexes

5th They differ in different years in the same diseases

6th They differ in different seasons of the year, ostruction of perspiration in winter producing catarrh in summer diarrhea

7th Sympathies differ from different predispositions in different people

By knowing the sympathies between different parts we cure different diseases with more facility. The stomach sympathizes more with the trachea than with the lungs, By knowing the sympathy between the Liver & stomach we cure Dyspepsia by first curing Hepatitis

We come next to speak of those parts where impressions made produce sensation.

Senses

There are five viz Touch, Hearing, Seeing, Tasting & Smelling, Dr Darwin adds another viz the sense of Heat

The three Senses of Touch, Taste & Seeing act mechanically

The Brain may be compared to a large City accessible by various ways. The nerves being the different avenues or modes of entry

Sensation enters by various ways. Impressions on the tongue & nose are chemical, the rest mechanical. — Air has no effect on the cuticle. - Sympathy between the skin skin and stomach arises from the continuity of the skin. — When the liquid moisture of the tongue is condensed, it is said to be furred. Depletion increases the sense of taste. — When sugar tastes bitter it is from the nerves wh convey the sensation of bitter being stimulated instead of the proper ones, in this consists Error sensus. It is here proper to observe that sapid bodies of every kind have a peculiar set of nerves appropriated to them and wh convey the proper taste of the sapid bodies, it has however frequently happened that the wrong nerves were stimulated in this case the ~~impression~~ was sensations were according to the nerves stimulated.

Dreams excite specific motions on the tongue & we enjoy aliments in sleep. The taste depends in some measure on the smell, as it is not so acute when a catarrh has affected our olfactory ~~Organs~~

Touch has been confined to the fingers, but it extends to all parts of the body. The sensations in generation are produced by the touch. I proceed to speak of the sense of touch by wh we discover hardness, softness, smoothness, roughness, pressure, heat, cold &c The perceptions acquired by this sense and that of taste, are less durable than those of the others senses

Peculiarities of Touch The covering of the body is called Epidermis. no arteries or nerves can be discovered in it, It possesses sensibility without irritability and protects the extremities of nerves from injury

2 Beneath the cuticle and connected with it is a soft pulpy substance called rete mucosum, it is like concreted mucus and may be separated from the cuticle

3 The true skin lies below this, it is composed of thick cellular net work

4th Connected with the skin are small glands which go to the cutis also sebaceous glands from wh issue a kind of liniment

5 The Hair comes from beneath the cellular substance & originates from a bulb, the hair then perforates the cuticle & carries a sheath with it

6th The cuticle or true skin is not confined to external parts, it exists in the urethra, bowels mouth of the Vagina &c

7th The sense of touch is influenced by bloodvessels wh accompany the nerves

Sensations are more acute according to the tension and fulness of the bloodvessels excepting in the sense of touch wh is improved by fasting. In this case there is said to be a diminution of the stimulus of blood. The sensibility of parts is influenced by the quantity of blood accompanying the nerves as the Breasts of Women, the Lips &c

8 I said formerly that different senses were supplied with differ

ent nerves, glands have different ~~procers~~ nerves. I shall often speak of the transition of specific sensation

9th The extremities possess the faculty of distinguishing substances as to their quality better than any other parts, by their smoothness. the nerves at the end of the fingers are preserved by the nails

10th To increase the sense of touch it is wisely distributed thro 4 fingers and a thumb, the sense of touch is thereby more correct. the temperature of the fingers should be neither cold nor hot. the brain should be regular

The soles of the feet become insensible to common impressions the lips possess a high sense of touch, this is obvious in children I have heard of persons who cd distinguish every card in a pack and tell the colour of horses by the sense of touch, it is no uncommon occurence for blind people to distinguish their acquaintances by the feel of their hands

To render this sense acute the Brain shd be preserved from pressure. It is more acute in darkness than in light It is increased by putting the hands into warm water & by rubbing the fingers over a rough surface

Accuracy in the sense of touch is acquired by habit. To this sense we owe our Ideas of the primary qualities of bodies. The mind originates in the sense of touch. The fœtus possesses this sense abortion is often produced by it, the place more reliance on this sense than any other, hence Thomas could not be brought to be=

leive in the resurrection of Christ till he had put his fingers in = to the wound in his side

Taste

The tongue is the organ in which this sense resides, the following peculiarities belong to the tongue

1st The tongue abounds with bloodvessels nerves & Lymphatics I have heard of a tongue half white, may it not be placed on a footing with seeing and hearing on account of its structure

2 This sense resides in the tip and edges of the tongue. The Palate and the fauces distinguish some objects of taste Belladona affects the palate & wormwood the Oesophagus

3 The nerves of the tongue project in small papilla accom = panied with small bloodvessels

4th The tongue abounds with bloodvessels wh pour forth a liquid to assist in masticating the food

5th The tongue is supplied with nerves from the 5th & 8th and 9th pair

6th The sense of taste is more acute in the tongue than the sense of touch in the fingers

7th It differs in sensibility in different ages, the most ex = quisite in infancy

8 The objects of taste are various Sweet, Sour, bitter, Salin

9th All tastes are excited by the solution of sapid bodies in the saliva if the tongue be dry, no taste is perceived. Metals are insoluble in saliva

10th This sense has some variety. Some substances occasion undulations of the nerves. It is also influenced by various circumstances in the tongue, as the state of the ~~tongue~~ air, Coffee looses its relish on a hot day & melons in cold weather are not pleasant. Changes of saliva influence this sense. By odours passing thro the nose, by fulness or depletion, – the former is favourable I knew a physician who always took a purge the day before going to a Turkey feast in order to eat the more. The taste of wine is improved by cheese

The perfection of this sense is influenced by habit, persons accustomed to the use of wine can easily detect the slightest adulteration, There was a gentleman in this City who could tell the wine from every parish in Madeira by its taste he had been a wine merchant for several years, another whose taste was so very acute that he could distinguish between wine taken from a cask and from bottles

Cold deprives sapid bodies of their power of exciting the sense of taste

Taste like the other senses can be transfered. a Girl who lost her tongue could taste accurately with the other parts of her mouth

In some animals it resides in the Stomach

There are different nerves for different tastes

Baker is of opinion that all sapid bodies are more or less saline
Reed thinks that by the union of the sapid body with the fluids of the mouth a tertium quid is produced and that the diversity of tastes may be explained in this way

The sense of taste is by no means an independant one, it is connected with smelling and seeing. When the eye aches the taste sympathizes. I had no idea of the latter on taste till I saw a wager won by a person who asserted that mutton and beef dressed in the same manner could not be distinguished by a person who ate each blindfolded. He went proved the fact. The influence of smell on taste is very great

The use of taste is to direct us in the choice of aliments very few are pleasant & unwholesome at the same time

There are a certain number of primitive tastes as there are of original colours & all the different tastes are modifications of them See Medcal Enquir Vol 1st

From its abuse by civilized people taste is most enjoyed by Savages. — Tastes are supposed to be 16 in number

Those animals in which the sense of taste does not reside in the tongue have it in some other part

High seasoned food is to the stomach what the colour red is to the eyes

Smelling

This resides in the Schneiderian membrane, the extent of this is to the Ethmoid bone

In animals which possess different degrees of smelling, the size of the frontal sinuses is different. — In the act of smelling air is discharged from the sinuses. — Pungent substances do not pain the membranes of the sinuses. — Moisture in the sinuses instead of

1st It is greatest in children
2 In no position do the sinuses discharge moisture
3 The mucus lining the inside of the nose, is deposited in the crypte of the nose, — moisture is indispensable to the act of smelling

There is great variety in the sensations of odours. Each odour has a specific sensation, specific nerves. — Error sensus occurs here as in other senses. The nerve which imparts the sensation of pleasant odours, sometimes looses its specific sensation and imparts that of fetid odours & vice versa Every sensation has its specific and proper nerves.

This sense is more universal than the sense of taste, it begins in early life. The nerves for this sense are larger than those of the organ of taste, When we wish to smell acutely we imitate grey hounds in making quick short inspirations. This sense is rendered more acute by shutting the mouth

The objects of this sense are divided into ambrosia, musk, vinous, nauseous, fragrant, aromatic, alliaceous, fœtid all odours are combined from 7 primary ones. — The sources of odours is more numerous than is supposed. They should be in a gaseous state. the matter of odours acting on the nose is too small to be ~~small~~ perceptible to the eyes. One grain of musk has been known to scent a room for 20 years and the urine of a skunk to pervade a whole township. Putrid odours adhere to garments and produce fevers. The great extent of odours is proven by birds being allured several hundred miles to Carion. It has been denied that Malignant fevers are produced by miasmata. — This sense is tributary to the eye a proof of the connexion between the eye and nose is evident in pungent substances exciting tears

The uses of Smelling are

1st To distinguish ~~odours~~ substances

2 It has been known to convey nourishment to the body

3 It discovers the connexion between diseases

4th Medicines which act by this sense remove acute and sudden diseases

5th Odours influence the mind. Rosseau calls it the organ of the mind. Its effects are more quick and numerous than from any other sense

6th It influences morals, pleasant odours having a happy influence on them

Lastly the long application of odours brings on fatigue. It is a happy circumstance that our smelling is connected with respiration, by it we are often preserved from disease and death, by enabling us to retreat from deadly smells. The Eagle and the vulture ascend high up in the air for the purpose of rendering this sense acute, The hog possesses this sense acutely, he smells domestic objects. The Deer forsakes his pursuer by his acute sense of smelling, the go against the wind. The Hound possesses this sense very acutely in consequence of his large ossa spongiosa, this sense seems to bring the sexes of animals together for the propagation of their species acuteness of smell is better preserved by smelling odours not very pungent. Country people have more acute smell than those who live in town, — A Boy brought up in a forest in Europe, and thus preserved from strong odours, had the sense of smelling so acute, that he could distinguish the track of his wife from that of any other woman, by the scent of the perspiration from her feet

The Arabians have this sense so acute that they smell their camels at 4 miles distance

A diet of vegetables affects this sense

The Bramins who live entirely on vegetables cannot bear the smell of Europeans because they eat animal food

This sense is subject to translation from one part to another

Many odours which are disagreable when concentrated are agreable when diluted. — musk —

a small portion of some odours is agreeable tho a large quantity is disagreable

Many objects yielding no taste have a pungent smell

The pleasure of smelling agreeable odours is heightened by contrast, thus after smelling asafetida &c the odour of a rose or pink is delicious

a pleasant odour in animals is a mark of their wholesome quality, — fœtid substances are unhealthy

I have said that sounds were sometimes not perceptible from habit, so it is with odours

Vision

For a description of the eye, vid Anat

Light is the finest of all material fluids. It does not pass immediately from the sun as has been supposed, but exists in every part of the solar system & requires only the presence of the sun to put it in motion

Light has been divided into 7 primitive rays. the colour of these rays are violet, Indigo, Blue, Green Yellow, Orange & Red, they may be remembered by associating

with them, the word VIBGYOR which is composed of the initials of all the colours in the order in which they stand

Colour is a mere quality of matter depending on the power of the substance to reflect different rays of light. — When a substance reflects all the colours of light, it gives us the idea of whiteness, when it absorbs them all of blackness

Vision may be said to be perfect when we can read a book easily at the distance of a foot from the eyes. The greater the darkness the greater the expansion of the pupil, we have been told of persons who could read in the darkest dungeons

All the motions of the Iris and pupil are voluntary in man, the pupil is generally dilated in chronic diseases. The colour of the Iris varies in different nations, as they are more southerly it is brown & black, in those nations situated more northerly it is grey & blue This is a wise provision of nature as the intensity of the Southern light is rendered less by the rays being suffocated by the brown or black Iris

The Indians in the northern parts of the U States have black eyes, they are not the Aborigines. The Esquimaux have the same as those of S America

Philosophers have proved that objects viewed are painted on the eye in an inverted position. How is it that we see them in their proper positions? The general way of answering this question is from the influence of habit. But I deny its influence in the present instance, for persons who have had cataracts from birth and have been couched for them & restored to sight in their mature years, see things immediately in their proper position. Here habit could have had no influence. The mind follows the rays of light

as they proceed from the object, thus the mind will follow the ray wh comes from the top of the object, tho it is painted on the inferior part of the retina & vice versa

Since we have two eyes and two retinas why have we not double vision? because two impressions of equal force acting at the same time produce but one sensation in the mind, Both the impressions on the ~~mind~~ retinas are synchronous & of course but one idea arises in the mind, The right eye is chiefly used in vision, vision is less true with one eye in distance and direction than with two acuteness in vision is more perfect in one eye than both. a young man who was couched by Cheselden thot that every object touched his eyes

The colour which most stimulates the eye is red, — a large proportion of the stimulus which supports life is carried on by means of the eyes. The size of the pupil discovers the state of the Brain in most diseases. The figure and action of the eye indicates the action of the faculties of the mind Why do we feel pain on coming from a dark room into the light? Because the Retina is more sensible of the stimulus of light by being for a time deprived of it

Why does the eye appear soft and languishing after looking a long time at a black object? Because black reflects no rays of light to stimulate the pupil to contraction, of course it dilates & gives the pupil that appearance

The Earth & vegetation is covered with green because it is the colour exactly midway between the two extremes of the most refrangible rays

If they were red, our eyes would not be able to bear so great

a stimulus, on the other hand violet would not be sufficiently stimulant

The evidence of reason is called seeing, how limited wd have been our Ideas of objects without this sense. The eye is as it were the mansion of the soul & the master peice of the human frame

<u>To preserve the Eyes</u> in perfection it is necessary to keep them so fixed in their orbits that the muscles will not be stretched, as is done by lying on the back and reading, they then support the eye lids entirely, reading in bed is a bad custom & ought be laid aside. It is perhaps equally injurious to look perpendicularly downwards on a book, we sh^d read on desks, or when we read a book we sh^d incline it

2 Receive the light from behind, so that it may fall on the book before it falls on the eyes. — or sideways and not anteriorly. Do not read in an excessive light. — We should change the size of the print in reading books. — Reading in the open air is injurious for the light is too intense

3^d In washing the face avoid pressing the eyeballs, for it flattens them very much if the pressure be often repeated

4th Vision is improved by blackening the eyelids, combing dark coloured hair over our foreheads is of use, by suffocating some of the rays of light before they arrive at the eye

5th The early use of spectacles is proper and highly useful to all who have any degree of weakness in the eyes, a desire of being thought too young for this, has been hurtful to many you may be able to lay them aside as you advance in years, as I have

many instances of this

vision is improved by examining plants, colours &c. — vision is sometimes revived in old age, it is said to be owing to an effort in the system to reproduce Antideluvian age. Human life before the deluge was on a footing with vegetables

Hearing

1st Of the nature of Sounds 2d Of the structure of the Ear

1st Sound is emitted by the percussion or collision of solid elastic bodies and propagated by tremors or a corresponding vibration in the air to the ear. — In sounds I include musical tones, — in noise the sound of explosions

The air is not the only medium for the propagation of sound, the earth and water also answer this purpose. When I attended the battle of Brandywine, a quarter of a mile between camps a large peice of ground, was covered with dust produced by percussion. the sound of cannon produces percussion in the Earth wh extends for many miles. the progress of sound is very rapid, it travels along the air with great celerity say 1142 feet in a second. — Furniture in a room prevents sound to a certain degree. the famous blind philosopher Dr Mayce could tell by hearing footsteps in a room whether it was furnished

I know a lady who can hear the ticking of a clock but she cannot hear the firing of a cannon. the deception of ventriloquists is owing to their speaking during inspiration

Hearing is by no means independant, but owes something to the nose for its perfection, We hear better after sneezing It owes something to the mouth hence we hear better with the mouth open. It is indebted to the eyes, we hear better by looking steadily at a person who is speaking. We hear better when breathing is suspended, more sonorous rays are collected by it. Ideas by means of speech are conveyed from the ear to the mind

The sense of hearing is sometimes translated. Haller mentions a deaf man who could distinguish the sound of a drum from all others by its producing a pain in his belly. An intimate connexion exists between the ear and voice, I knew a woman who could distinguish the taste and colour of substances with her ears, as well as I could with my eyes & mouth

Some people tho deaf can hear when riding over stones this acts only by giving more tension to the membrane of the tympthanum. The ears are more faithful in conveying ideas than the eyes. We hear imperfectly when yawning in consequence of the temporary stoppage of the Eustachian tube

<u>Advantages of the senses combined</u> The senses combined form a large portion of the stimuli of animal life We are indebted to the senses for our minds, with=

= out the senses we should be below brutes, Ideas are the offspring of sensation & without the senses there is no sensation

Nihil est in intellectu quod non prius fuit in sensu there is nothing in the understanding wh did not get there by the senses The fewer and weaker the impressions the more feeble is the mind. A Gent who died sometime ago on making his will valued his eyes & ears at £10.000 each

How often our senses deceive us I shall shew you

1st Many things wh are called deceptions are false

2 From the perceptions we acquired by habit, as handling play = things in infancy

3 Ignorance of the laws of nature, as the vulgar opinion of the position of our globe

4 Diseases of the senses

I wish you gentlemen to attend to the dependance of the senses upon each other, Children reason better than Philosophers

The original necessary connexion of the senses with reason is obvious therefore I say in the language of the Episcopal church "What God has joined together let no man seperate

The Operation of the Human Mind

I am not singular in placing the mind in Lectures on Physiology, it has been done by Haller, Boerhave Gregory &c. The operations of the mind are the internal senses & depend as completely on impressions as Seeing, Hearing, Tasting Smelling or Feeling

1st The knowledge of this is the noblest acquirement. The mind of man constitutes his identity

2 The history of its faculties is the most certain kind of knowledge, it consists of facts and relates to actions

3 It is an intelligent science, the bones of the head are no more capable of demonstration than the faculties of the mind

4th It is the most useful of all sciences, it is useful to the statesman, the divine, the physician, Without a knowledge of it, it is impossible to understand the diseases of the mind

Many diseases of the body cannot be cured without a knowledge of the mind

In treating of the mind we shall first consider its Nature 2d Its ~~operations~~ faculties 3d Its operations, we shall find it of great use in our Pathology & Practice of Medecine. I shall endeavour to make it plain, short and comprehensible by you all

Physicians as well as Metaphysicians have studied the faculties of the mind and its operations, many have

confounded the faculties with the operations, there are scarce two who give us the same account of them, even Dr Reid calls reason a faculty

The faculties of the mind are Instinct Memory Imagination, Understanding, Will Passions and the Moral faculty. — The mind is an unit but is moved by its facul=ties

The more arched and elevated the skull the greater is the intellect. of this man possesses most of all beings the Elephant next and the goose least

Instinct differs from understanding. The last is a native faculty of the mind. instinct is the effect of impressions made before birth it only declines and is never entirely lost. memory sometimes supplies the place of Instinct

The first Question that occurs relative to the mind is what is it? & of what is it composed? On this subject there are many opinions. I will give you the different opinions on the Phrenology of the Mind

1st That there is but two parts in the human being, spirit and body; & that the mind is composed of very fine & exquisitely sublimated matter, connected to the body, by juxtaposition but capable of existing without it, in a state of seperation from it. This is the opinion of Mr Law and appears to be the opinion of Mr Locke; who thinks

that the great author or first cause only is immaterial this opinion I think is correct

2 That it is a germ or seed lying dormant in the brain containing rudiments of the mind similar to the present mind It is indestructible and will unfold itself at the last day when it will unite body and mind. Paleys Theology

3 That there is no mind Material, or Immaterial, but produced by impressions on the Brain, and that these impressions as certainly produce thought & the other operations of the mind as impressions on the Retina produce Vision, or Sapid bodies on the tongue taste

Some have supposed this last opinion contrary to christianity, — but this in my opinion is not the case they say that the soul or mind must be spiritual for matter is destructible, whereas the soul is eternal and will endure for ever. —— The Idea of the destructibility of matter I deny. you may alter it give it a thousand different forms, but to annihilate one particle of it is impossible

What I shall teach you on the subject of the mind does not interfere with either of these opinions. If you choose to read on the subject I refer you to Drs Price and Priestley

There is no necessary connexion between the immateriality & Immortality of the soul. Spirit possesses

no self existence, — It is immaterial

The only Argument in favour of the Immateriality of the soul mentioned in scripture is an opinion of St Paul, without revelation we can have no Idea of a future state

St Pauls argument in favour of the resurrection viz that seed cannot grow except it die, is incorrect. The seed does not die, It is the capsule only that dies & furnishes the fruit aliment

4th That the mind is wholly immaterial. This was held by Plato & Cicero. It is maintained by Ferguson Price & most divines

Mr Bruce thinks we consist of spirit and body only what is called soul is nothing but what I call animal life

Mr Fox died in the belief of spirit independant of matter. There is no necessary connexion between immateriality & immortality. To suppose that spirit is necessarily immortal is to suppose God to be stript one of his divine attributes. We cannot admit that thought is independant of matter

A sleeping state in the grave of more than 300 years duration will not appear more than a mo=

ment to the mind. The spirit will be insensible to the lapse of time

Before entering on the subject of the faculties & operations of the mind I must deliver a few observations

1st The history of the mind which I am about to deliver requires the belief that the body and mind mutually act on each other, and the senses as we before observed are the avenues thro which the mind receives impressions which excite it to action, and the operations of the mind are the result of those impressions

I call them faculties in conformity to custom. Haller calls them internal senses, Hartley calls them - - -

Their operation is the effect of specific motion, The faculties have been divided into active and passive. I do not admit the divisibility of the mind into parts It is an unit

2 Many phenomena make it evident that each of the faculties in the mind occupys a particular part or spot in the Brain, when in a healthy state. the Brain being the seat of these faculties as the heart is of the passions

Dr Gall supposes the Brain to derive a specific intellectual and moral character from the author of all nature

3 That all operations are produced by impressions made on the body wh excite motion in that particular spot of the brain where these operations are performed. I have said that the mind & body of man were formed at the same time. the first impulse of Blood sent to the Brain awakens its faculties

The mind remained quiescent till it pleased God to breathe the air of life into mans nostrils

I think if a microscope of sufficient power could be applied to the brain in a healthy state I beleive every action of the mind wd give a perceptible motion to the Brain. If the microscope cd be directed still further I beleive specific motions for each idea cd be perceived. — whether of the electroid fluid or of the matter according to Dr Hartley wh composes the brain cannot be ascertained and is of no importance, — If there were no specific motions all thought wd be the same. Nor do I think it all difficult to conceive of such minute motions when we consider that the membrana tympani wh is 100,000 times lip than the brain is capable of 500,000 different motions & yet each of these motions is capable of exciting a distinct Idea in our minds

Impressions on the brain arise from 2 classes of stimuli External & Internal. The former as I said before are the senses, among the latter may be reckoned some of the actions of the mind, wh being reflected act as stimuli but they are of trifling consequence compared to the senses, for without these no mind cd exist

4th That the perfect use of the mind depends on a certain medium of motion resulting from a particular consistence In adults and middle life it is of proper consistence. Maniacs & very old people have it too hard

Instinct

Instinct is intended to supply the place of the faculties wh belong exclusively to the human species. In the fœtus it is the effect of impressions made in the womb, by the meconium perhaps this is the final use of the meconium. Instinct differs from understanding in being the effect of impressions made before birth. Instinct never dies in the human being. It often supplies the place of the Intellectual faculties. Next to instinct is

Memory

This is the most wonderful of the mental faculties, — it is the most necessary and useful of them all, — without it the others are useless. Hartly justly says there can be no mind without it. — Dr Reid very justly observes, "that if the phenomena of memory were not so familiar to us, we should be as much at a loss to conceive how it was possible for us to recollect the events wh occurred 20 or 30 years back, as it now is for us to conceive of Prescience as one of the attributes of the Deity memory often supplies the place of Intellect. — The lowest grade of memory is reminiscence; a child three months old recognizes its mother when it sees her, but if she be long absent forgets her

Many of the objects of memory exist in a present state, they are called in by the will and are formed into Ideas

Memory is of two kinds, active or ready & retentive, they both differ from Reminiscence, as in this, the presence of the object which excited the original Idea is required.

The latter characterizes the mere scholar, the man of genius possy=ses both, — Memory commences at a very early age, about the 3d year according to Shakespeare. hence in his Tempest he makes Prospero ask his Daughter Miranda who was cast on the enchanted Island at 3 years of age whether she recollects any thing of her native cont̄ry "By what? By any other house or person? &c

This faculty is very much exerted in the first years of infancy as much is to be acquired in that time. — There is no such thing as oblivion in the events of children. — In the first years of life the memory is employed in words & signs. they learn not only a language consisting of an immense number of words, but also the ideas wh̄ these words represent. In the 3 first years children learn qualities, magnitude num=bers, heat, cold, pleasure & pain. hence Dr Gregory truely asserts that a child learns more in the 3 first years of its life than in 30 afterwards

Civilization has a powerful influence on the extent of this faculty. Indians possess it in a very limited degree Their method of treating with their enemies is an exam=ple of this. They arrange themselves in a row when they are to hear a speech, or a treaty read, so close as to

touch each other. The first remembers the first few sentences till his memory is saturated, he then jogs his next neighbour who attends then till his memory is also saturated, he then jogs his next neighbour who does the same, and so it goes on till the subject is concluded. They then retire and club up their respective proportions, from wh they return an answer. Some Savages have so bad a memorys that they cannot recollect numbers to a greater extent than they have of fingers & toes. Helvetius even tells us of some who cannot count further than three

Memory is a generic term & is divided into different kinds. There is a memory for places, Faces, Words, Numbers, Names, Ideas &c each of these is supposed to hold a different seat in the brain, each may be injured by disease. It is said that Dr Whitfield never forgot a face he had a good memory for all things. — A memory for places belongs to many animals besides man among these are the dog and horse. Children possess from nature & Players from habit a great memory for words. Dr. informs us of a young Corsican who repeated a discourse which contained 36,000 words, after hearing it once read

Cyrus had a most amazing memory for names, his

army consisted of 100.000 men & he cd call every man in it by his proper name

Memory for numbers is possessed in a remarkable degree by many. Jedediah Buxton after hearing a long sermon preached, told to an unit the number of words it contained

Thomas Fuller can by his head (to use the vulgar phrase) multiply 12 figures by 12 or any number included and give the proper result. In all cases of extraordinary memory there seems to be a deficiency of judgement, hence the Epitaph on a man remarkable for his memory and want of judgement

Hic jacet homo felicis memoriæ
In expectatione judicii

Memory for Ideas is by far the most valuable; it is the highest grade of this faculty. It distinguishes the learned from the unlearned, the savage from the citizen. Few people possess all the kinds of memory to any considerable degree

The loss of memory is called <u>amnesia</u>

Words are soonest forgotten in old age, because they are entirely arbitrary

Dr Lardner whose memory for ideas was very acute forgot his own name. Linnaeus who was a prodigy for memory forgot the maiden name of his wife, after recovering from a fit of the apoplexy

I know a gentleman in this country whose memory for Ideas is very complete, but for words is quite the reverse

Imagination

This is a peculiar faculty differing from memory
1st Because memory has relation to the past only while Imagination is unlimited as to time past, present or future
2 Imagination has for its objects imaginary as well as real ~~objects~~ circumstances
3 Memory is the magazine or ware house of the mind . . . Memory may be compared to History, Imagination to Painting or rather the Images on a camera obscura. Memory may be compared to a vessel moved only by oars, Imagination to a vessel moved by both sails & oars

Imagination is called the representative faculty of the mind it is its pioneer to all useful discoveries in the arts & sciences it is a Christopher Columbus with respect to its power of discovery. In recollecting ideas there can be no imagination without memory. The possessor of this faculty assails the heavens and explores the worlds wh revolve round the earth. it encroaches on omnipresence itself one of the attribute

of the Deity. It traverses all countries near & remote. Every age past, present and future, conveys us over the remotest surface of the globe & throughout the universe in the twinkling of an eye

It differs with respect to its objects, in Newton its objects were the material world, the laws of Nature and the works of nature. In Locke it was the human mind. In the immortal Shakespeare, men & manners, all the occupations, passions & business of man &c &c

Ideas of Imagination are received from the eyes & ears. Imagination is an essential ingredient in genius, there can be no invention without it

Is there any difference between Imagination and Fancy? I think there is. Fancy says Stewart enables the poet to under his figures rich and luxuriant. Imagination only supplies him with sublime and beautiful images they differ further in their objects. Those of Fancy are Phantasms, Witches Ghosts &c Imagination concerns itself more about realities or tho equally false not so improbable or unnatural

Understanding is essential to the human mind according to Locke the other faculties are subservient to this & this word is frequently used as including them all. Hence Locke's work is called an Essay on the human Understanding

The imagination furnishes us with Ideas, the Understanding connects them. It is the touchstone of truth and Error. It is this that directs the pen of the Poet & gives to "airy nothing a local habitation & a name" Without understanding the Mind wd be nothing but a toy-shop. To carry on our comparison of the ship, Memory may be compared to the cargo, Imagination to the Rudder and Understanding to the skilful Pilot who conducts them safely to Port

Memory and Imagination furnish the raw materials for a house as it were, Understanding is the Carpenter who arranges them into a beautiful building

Will

By the will we are enabled to choose that wh is good and to refuse that wh is evil. It has 2 offices to perform. It embraces truth or error through the understanding. It embraces Moral good or ~~Moral~~ evil thro the passions. The will is the seat of power and the basis of human

happiness. This determines whether an action be right or wrong

The Casuists say if a man puts out his neighbours eye by accident he commits no crime, but if in a fit of anger or wilfully it is criminal. Hence the Schoolmen tell us "Voluntas facit peccatum"

Memory may be compared to a board. Imagination to the magnificent furniture of it confusedly thrown together, the Will to a skilful artist who arranges the furniture in such a way as to combine Elegance with convenience; or to continue the comparison of the ship wh is now arrived in port. The will is the boat wh brings the cargo on shore

<u>The Principle of Faith</u> appears early. It is deep seated and universal I consider it innate as Imagination It has been defined to be "The evidence of things not seen" to wh I add not heard, felt or tasted &c. If we had not faith in those who put up our medecines we wd not take them for fear they were poisonous. If this faculty were suspended we shd be as bad off as if our vision or hearing was taken away. This principle is a law of nature and does not result from experience. It is a better

and more powerful source of knowledge than reason. It is an involuntary principle. The knowledge acquired by it is most certain

The Passions comprehend

Passions of the Mind

Passion is a generic term. They are divided 1st Into passions properly so called 2d Emotions, the seat of these is the heart. The passions properly so called have for their object future good or evil; all the objects of the passions act with the will, Emotions are succeeding impressions of the passions producing motions in the body, they are generally produced by present good or evil Emotions are a higher grade of passions

The Passions may again be divided into Passions & propensities. Passions differ from Emotions in being accompanied with a desire of revenge or aversion wh the latter are not, some of the Emotions as anger appear to be accompanied with a desire of revenge, but this is not connected with the emotion

The Passions are Joy, Grief, Avarice Love Hatred & the like Emotions are Anger Fear &c &c, Affections are Sympathy Friendship &c

Moral Faculties

These are divided into Moral Faculty, properly so called. Sense of deity and Conscience

They are innate and exist at birth & are unfolded as they

receive impressions & hence have originated many disputes respecting innate ideas. The aptitude to specific impressions is as great as that of the eye. The Moral faculty is as necessary & universal a component part of the mind as memory or imagination

It exists in some persons in an imperfect state. Locke says we are born with moral capacities the reverse of this is true

The Moral Faculty may exist independant of Conscience Conscience is seated in the Understanding, the Moral faculty in the Will. It has been confounded with the Sense of Deity & Conscience. The Moral faculty may be compared to a legislator, Conscience performs the office of Judge. Conscience judges only our own actions the Moral faculty the actions of others. The Moral faculty is sometimes present while conscience is absent, hence a drunken man seeing another reeling along will say look at that drunken rascal in this case the moral faculty admonishes him of the impropriety of the action, while Conscience whispers nothing to his own ear

Sense of Deity

By it I understand the sense of a supreme, good, and intelligent being. It is universal among savages as well as civilized nations. A certain evidence of the first great

cause no man ever did deny

This faculty distinguishes man from all other animals, many other animals possess some of the faculties of the mind, but this belongs to man alone

The moral faculty even belongs to some to some animals, witness the shame which a dog expresses when he is chid for a fault & his penitent conduct looks

But no animal but man has any notion of a deity. Hence the only rational definition that has ever been given of man is "a creature capable of Religion". Man is as necessarily religious as he is a living creature. Some men have denied the existence of a God, but they really believe the contrary at the same time. He could as readily be happy without society, as without this sense of Deity. Capt Cook says he has seen savages who did not possess it, but it is a fact wh obtains so generally that I think he was deceived

Whether it manifests itself in worshipping an Image the Sun, Moon or Stars. a Cat, Dog, Bull, Crocodile or even an Union. Still I repeat it every man possesses a sense of Deity, tho it might be obscured by Superstition. You might with equal propriety doubt of

the Universality of vision, because a nation of Africans have their prevented, as doubt the Universality of the sense of Deity from the perversion of it

It sometimes exists in a torpid state. The sense of Deity is in a sound or unsound state in proportion as the sense of the first cause appears. From revelation and not from tradition is this sense derived, without it the sense of Deity wd have been as void in men as in brutes. Even that of the most barbarous nations originates in Revelation, as well could I conceive of hearing without sound as of a sense of Deity from any other source than revelation

Conscience is the Regula regulata non regulans
The moral faculty is the Regula regulans non regulata

2d It regards our own actions not anothers
3d It is never absent from the mind except in such as St Paul describes as having it "seared with a red hot iron"
4th It is seated in the Understanding. It does not regard the actions of memory except in a few cases. Conscience may be compared to a high Court of Errors & appeals which often reverses the decisions of the Moral faculty

The other faculties are regulated by it. Conscience is derived from the Latin words con & scio to know together. In conscience we possess as great a blessing as the Supreme being could have confered on us. His care of us is evinced in various ways; in the number of our moral faculties; In rendering mental happiness independant of the other faculties, also with the certainty and celerity with wh they act &c

The operation of our other mental faculties are slow & uncertain that of the moral faculty swift & certain. Some have supposed the moral faculties to be a modification of the ~~mental~~ Intellectual faculties. Truth has but one front. All the faculties act by a specific stimulus. The Rational faculties were given for this world, the moral faculties appear to be designed for that wh is to come. Speculative truth is the object of the intellectual faculties. Right & wrong are the objects of the moral faculty. Our moral faculty acts with instinctive celerity so that an unlearned man may be as honest and happy as a learned one. We cannot perform our offices without the action of conscience. Conscience like Mentor in Tele=

= machus, is our safeguard against a thousand dangers to wh we are exposed. Conscience tho a judge is still our friend

There is as much philosophy in supposing the Spirit of God to act on the mind as to suppose that light acts on the eye in producing vision

The faculties may be improved by education so as to increase our happiness, but not in such a manner as when they are acted on by divine influence, — the senses are sometimes translated, this will apply to the Faculties

Life has been compared to a voyage; the moral faculties are our compasses, Conscience keeps the reckoning & the sense of Deity guides to the desired port

The sense of Deity is coexistent with our lives, as well might we say that the passion wh the sexes have for each other was formed at Puberty because it appears at that age, as suppose that the sense of Deity is not coexistent with existence

Conscience is given us as a witness for the Almighty

<u>Taste</u> I define to be a sudden perception of beauty or deformity in the works of nature and art. it has been mistaken for judgement

Intuition consists in a prompt perception of truth & error
All the faculties of the mind are tributary to each other, — they are all more a less connected, — They ought bear just proportions to each other. They may be compared to a well Regulated government in wh the Memory and Imagination is the House of Representatives, where evidence & facts are collected — The Understanding is the senate wh has the power of passing laws. — The Will is the executive officer, — The Passions are the deputies of the Executive. — The Moral faculties are the Courts of Justice in wh those laws are enforced. — The practice of swearing by oaths is the sense of Duty. — Conscience is the high Court of Errors & Appeals. Such a government resembles a wise man. Governments are only perfect as they accord with the human mind

I now pass on to the consideration of the operations of those faculties.

Operations of the Mind

They are Perception, Association, Judgement, Reason. you will recollect them in the order in which they take place by the word PAJR

Volition is an operation but its precise order cannot be fixed. It acts after or before any others

Perception This is the most simple operation of the mind it is the effect of sensation excited thro" the medium of the senses; by Perception objects are identified e.g if I place my hand by accident on a heated stove perception of pain is the simplest and first action of my mind & yet even here memory and understanding are concerned I hear a sound like one I have heard before, I know by habit and memory whether it is the sound of a brute or of a man. The result of this perception is what Locke calls Ideas. — Perception is seated in the Understanding

Descartes supposed that Ideas were only images of objects, as a horse a house &c

Bishop Berkley supposed ideas to be merely a deception of our senses & that there were absolutely no objects in nature

When this hypothesis had made a noise in the wold and it was argued that every thing in nature was made of a subtilized spirit. — When human folly had thus got as every one supposed to its highest pitch, Hume published his essay on the Human mind. Thus Gent amongst these Philosophers we sh^d be annihilated, one destroying the body and the other the soul

Every idea in our mind is supposed to be an impression

made thro the medium of the senses & lodged on the brain as on wax. — or else made thro the medium of the imagination this I infer to be false. 1st The texture of the brain is incapable of receiving impressions of substances as on wax

2d From our being able to form Ideas of things having no form or figure, as heat cold &c

3d Our imaginations are different at different times respecting the same substances. The excitement of the mind depends upon the action of stimuli

I divide perceptions into 2 kinds 1st Ideas properly so called, — derived from substances. 2d a knowledge of things not sensible, and thought a mixture of sensation and Idea what Dr Reid calls notions or thoughts

Ideas are the effect of motion excited in the brain & communicated to the mind as well as sensation, similar impressions excite the same Ideas

How do we acquire new Ideas? It is by association by an impression on some other part, communicating that impression to a part distant from that where the impression was originally made. Impressions on the minds of old people thro the brain are less capable of reproduction than in young people. Boxes have only remeniscence because they do not speak

The explanation of Ideas applies to thoughts. Thoughts are combinations of Ideas. Ideas are the raw materials from wh the mind manufactures thoughts. Ideas therefore are the representatives of substances. — they occupy no space, hence we comprehend the vast extent of memory in fact it may be infinite; for Ideas no more produce a plethora than words can fill a room. They are totally dependant on stimuli

<u>Association</u> is called cohesance of thought It is an operation of several faculties united Memory Perception &c,. Tomorrow upon looking at the stove. the Perception & Memory of having before seen it, are both excited in the Brain at the same time, and association is the consequence Association is to the mind what Sympathy is to the body

It consists in a single Idea exciting a number of other ideas wh unite together. — We are as unable to stop the current of thought, as we are to arrest the course of the planets. This operation ~~faculty~~ is as necessary to the others, as wind and water are to mills. — We are able to associate Ideas of things we have never seen heard tasted smelled or felt. What then is thought? Motion in the brain produced by stimulus How does stimulus produce thought? By producing an impression on the nerves wh produce action in those parts of the brain wh are the seats of memory Imagina=

&c. Ideas therefore I repeat, are mere qualities, as much so as sound from a bell

We cannot think of spring without thinking of the singing of birds & the verdure of the fields. Who can hear of a hero without associating with it the name of Bonaparte. of a great physician without thinking of Cullen, Sydenham &c. The recurrence of the objects of the mind by the association of Ideas is the cause of what has been called <u>abstract Ideas</u>. Scholars wd be easier taught by those who are acquainted with the mind. We acquire a love of study by thinking of the reward attending it Bloodletting is abhorred because the shedding of blood is associated with murder. Brutes feel the influence of association, a horse is afraid of a drum at first but feed him in a tub placed on a drum & he will not run from it

1st Association is influenced by place. With respect to the place in wh you were when the first Idea was excited By looking stedfastly at a sign in the, you can sometimes recollect the ~~place~~ name on it, wh you were puzzled to do before

2d By time. Christmas day is always associated with the events of that day. The fourth of July with the declaration of Independance of the U States on great Britain

3d Posture of the body. If you wish to recollect an Idea it wd be well to put yourself in the same posture of body in wh you were when the Idea first occured

4th Pleasure. A graceful speech is remembered much better than an ungraceful one &c &c

5 By Pain; hence women in dispute relative to the date of any occurence always refer to a childs birth. They have been called living annals or almanacs. Hence also boys were formerly whipt at lands marks to make the recollect its situation in giving evidence at a future time

6th Letters are a source of association, thus a student could not recollect whether the umbilical cord contained 2 veins or 2 arteries till he associated it with Dr Boerhaaves name wh contains ~~but~~ two a's & but one v

7th The Eyes in writing increase our power of association. Dr Clarke says a man who wishes to become eminent in learning, must not only read much, study & hear much but write much. Thus Dr Priestly became master of an important subject, that is by writing he committed to paper what came into his mind

Certain arbitrary signs addressed to the eyes, as a thread tied round the finger will recall the Idea we associated with it

8th Similar sounds recall Ideas, hence the Swiss are melancholy when they hear the tunes of their native country played as they recall past times &c On hearing a cow

bellow we think of cows milk

9th Words create a remarkable species of association, we are frequently able to repeat a whole poem wh we have read merely from hearing the first lines of it. I knew a gentle=man who having been at the terrible earthquake in Lisbon could never hear the word "Earthquake" repeated without being seized with the greatest horror. — The pronunciation of the word "Blood" had a similar effect on a Gentl as he was always seized with a fainting fit. — A boy was affected in like manner by the pronunciation of the word "Jesus" as he had heard his mother pronounce that awful name during a thunder storm, at the moment she was struck with lightening. — Words wh have no imme=diate connexion with the idea or event & yet resemble it in some particular influence association, thus a Sailor forgetting the name of Alexander Alexander and wishing to make some inquiries respecting him, told the person to whom he was speaking, that it resembled Point no Point (the name of a place about 6 miles from Phila) this brought the name immediately to the persons recollection and he informed the sailor that it was Alexr Alexr he was enquiring for

10th Certain degrees of heat and cold, thus a warm day

in winter puts us in mind of spring and all its enjoyments

11th Odours act powerfully in influencing association. I knew a lady, who cd always have a vivid remembrance of her mother who took snuff, merely by taking a pinch of it herself

12th Interest. a miser never forgets the place where he deposites his money

13th Ties of Consanguinity. As the sight of a ~~parent~~ family by a fond parent

14th Customs and Habits influence association. A Gardener when travelling on seeing a fine spot of ground, is apt to say such a spot wd make a fine garden. — A Soldier marks out such a spot for an encampment. Genl Moreau when riding out to Germantown for the first time, was often heard to say "such & such a place wd make an excellent situation for a camp" or fortification

It is of importance for a physician to attend to these matters. Mr Hume calls man "a bundle of habits" If by habit he meant association he was correct

Judgement is a perception of the similarity and dissimilarity of things. The mind without this wd be a chaos. It consists in making out one simple proposition from two or more Ideas acquired either by association or directly from the memory. For instance if I am called to see a patient in Jail and I find him labouring under symptoms wh a number more of his comrades have in common with him, and if I ~~find him~~ suppose the disease to proceed from the same cause in all, viz Contagion, this I say is an act of judgement

We distinguish faces by judgement only. The operations of the mind go further. A Grazier in this city can distinguish at first sight the cattle of every county in the State. Judgement sometimes does not exceed the limits of experience. Correct comparison is called discriminating judgement. That which is Perception in us, is judgement in children. The judgement acts as necessarily under arguments as the senses act by impressions made on them

Reason is a more exalted operation than Judgement. It is the highest intellectual operation of the mind. It may be said to consist in deducing principles from Ideas, if for example I see the application of cold air serviceable in Small pox and I suppose (knowing fever to be the same in all diseases) that cold air w^d be useful in Bilious or Yellow Fever, I exercise my reasoning powers. From several propositions I deduce one principle. — The first Proposition is, that cold air is of use in Small Pox 2^d that small pox and y Fever are both fevers of the inflammatory kind 3^d that the operation of cold being sedative will be useful in all inflammatory ~~diseases~~ diseases; from thence I judge that cold air will be useful in the yellow Fever

It is connected with correct perception, related association & sound judgement, in its highest state. But it may be connected with unrelated association and unsound judgement

There may be perception and association without judgement. Madmen possess perception & very remarkable association Fools have them both but no judgement

Again there may be judgement without reasoning powers reason is one of the characteristic distinctions between men and brutes. Some animals however besides man seem to possess it

Genius differs from reason, the course of the latter is in order, that of the former is irregular. Genius is reason

with wings, Reason is Genius on foot, Genius flies thro the air, Reason and Judgement travel on foot. Reason with reverence be it spoken does not belong to God. — Genius is more fallacious, it operates with respect to Ideas not related, Reason only such as are, & rejects such as are false & admits the true Genius might be called intuition. Reid has confounded Genius with common sense, they are widely different

Reason avails itself of the relation of facts to each other, of wh it had no experience. The word Reason is derived from the Latin word ratio. It places things says Butler that are confused in the understanding in the regular order of nature.

Reason possesses a creative power, it acts as the refiner of raw materials

Intuition most commonly appears in Generals Merchants & Sea Captains. intuition is a higher grade of Genius. Reason Genius & Intuition form a scale of wh Intuition is the highest

Common Sense is a quality of vulgar minds, wise men sometimes use it, but only occasionally. It is more correct in common people. I refer you to "Moral and Philosophical Essays" printed by Bradford. Adam lived before the fall without reason, he had no call for it, he acted by an instinctive Genius or Intuition. Reason is refined by Judgement

Taste is a faculty by the operations of wh we are able without the aid of judgement to conclude about the propriety or impropriety of any thing. I say exclusive of Judgement & Reason some have supposed taste to depend on them, but it operates instantaneously. Taste then I wd define to be a distinct faculty of the mind a sudden perception of the propriety or impropriety of any thing. It act independant of judgement but not unconnectedly. hence they have been confounded But you might with as much propriety confound moral Faculty and Conscience for they act as much in unison as taste and judgement. The Passions sh not be overlooked, they are the stimuli of genius, they are to the mind what the senses are to the body. Taste seldom awakens till adult age

As the senses are the avenues of knowledge we sh begin with teaching children in this way. The first thing that Adam was taught was Natural History. We sh begin with teaching children Geography. It is much better than filling their minds with Latin & Greek

Let a boy be taught the Modern Languages I am not opposed to the study of the Latin & Greek languages. As the operation of the Judgement & Reason takes place at 20 teach the sciences at that time not before There is not a boy at 15 years old who is fit to read Latin, he can learn no more than English words in the Latin language

The Faculties of the mind decline as follows, the memory de=
=clines first, there is a memory for names, for places, words
ideas, these decline in the order laid down. The Imagina=
tion fails next; next the Understanding. the faculties
decay in order

I never saw the moral faculty & sense of deity weak=
=ened in old age in a religious person. the mind decays
as the nerves loose their power of transmission of impressions

Attention is the continued application of the mind to
one subject. It is the first operation after continued perception
men of limited minds are attentive

Reflection is the application of the mind to the particu=
lar properties and qualities of one particular object

Contemplation is the application of the mind to a variety
of subjects, this belongs to men of the greatest abilities &
talents. Bacon Newton and Locke were contemplative
characters

Wit is a very quick operation of the mind, accompanied
with very sudden quick perceptions. The Ideas are either
similar or quite the contrary & please by contrast. It may
be defined a sudden assemblage of Ideas or Images with=
out resemblance to each other. The strength of perception
nay the very quantity of the above faculties of the mind
depend very much on Education

The pleasures arising from this are owing 1st to the impression of truth 2d To the impression of novelty. Wit gave Dr Franklin much pleasure but no laughter

Operations of the will

The first thing we shall state relative to the will is its ability to attend to more than one thing at once. A woman can walk and knit at the same time. Does the will act from necessity or freely? on this thorny question philosophers are much divided. Man acts necessarily or it wd destroy the prescience of the deity And he acts freely in some measure, or it wd destroy all responsibility on his part. which I believe not to be the case

My doctrine of animal life is calculated to explain it. All the actions of the will are the effects of stimulus, the will has no self determining power Free agency is the result of reaction in the will. As animal life ceases to act on the abstraction of stimuli so the will ceases when the motives are abstracted from the mind. Free agency is dishonourable to the Deity. It places the creature above the creator

This view of the subject is by no means unfriendly to morals and religion, it is actually the basis of

them. It places the deity on the throne of the universe. as in the animal body in a healthy state, we have no sensation of stimuli so in the will we have no sensations of the impressions acting upon it. When we act most free we act ~~most~~ necessarily & when most necessarily we act free

Consciousness

Consciousness differs from conscience in embracing that kind of knowledge wh we have of our own existence. It has been said that because we think therefore we exist. Consciousness is sometimes lost in Hypochondriasis. The sense of our existence is a simple perception, we are conscious of the lapse of time only from the recollection of our Ideas. Maniacs loose their consciousness. In sleep we loose this faculty as in dreams This loss is the cause of morbid excitement. Consciousness of personal Identity is more perfect in proportion to the number & perfection of our senses

It is lost in dreams by supposing we are what we are not. The operations of Judgement commence in youth Reason acts in riper years. Dr Franklin exhibited no decay of his mental faculties in the 7th year of his age. Constant exercise of the mind strengthens it, as agility does the extremities

I hope I have rendered the study of the mind somewhat

important & easy of comprehension. It is very necessary to a physician. This study requires no books nor like the body does it require dissection. It is itself a little world. Globes Earths, Suns & Planets are nothing in comparison to the human mind. In the gift of immortality man is on a footing with his God

Comparative view of the Mind of man with that of Brutes

Many attempts have been made at this comparison
1st It is said that man is a sociable being. So are all gregarious animals
2d Man is said to be an anticipating animal so is the Beaver
3d Man is said to be progressive in knowledge. Of the generations of men this is true. An old horse is more sagacious than a young one

Difference of the Mind in Brutes 1st It is admitted that mind is in proportion to sensation. Brutes are limited to the senses Seeing. Tasting. Smelling. Hearing They have the sense of touch in a very coarse degree They are inferior to man
2d The Brain of man is larger in proportion than that of brutes

3 The impressions on Brutes instead of falling quickly on the mind, fall on their limbs

4th Brutes have no speech, here they are materially different

5th They are inferior to man in mind & knowledge for want of fingers

6th They have no signs nor monuments to perpetuate their knowledge

7th They are inferior in mind to men from the limits of their objects of knowledge. The more men limit their studies the more are their minds contracted. they then become on a level with brutes

8th Brutes have instinct more perfect than man

9th Brutes have reminiscence they recognize roads. They have little memory and are devoid of imagination They have little understanding, but some passions

10th Brutes appear to possess moral faculty hence we often hear of a faithful horse &c they often shew shame, hence I infer they have no conscience, no sense of deity. This sense constitutes the difference between men and Brutes. Man is necessarily a religious being

11th Brutes pursue associate & combine, they have some Judgement but no reason. It is impossible they shd have reason, they have not the means of it. They have not enough memory. They are incapable of abstract Ideas

12th Brutes are governed by present pleasure or present pain. This is reversed in man. From a review of these differences it seems that the faculties of men & Brutes differ in degree not in kind. Thirdly

Men live unreasonably with all their reason, Brutes live reasonably without reason, — We might learn something by an inquiry into their future destiny. Some suppose them destined to immortality. If they do not share with us in immortality it is because God has been pleased to limit them. If we be immaterial they are

We are immortal not because we are said to be immaterial. We are immortal because the supreme Being has pleased to make us so

In reviewing the Lectures of some days past, I am naturally lead to reflect that I have advanced sentiments wh will meet with much opposition. I have been exposed in my little Bark and I hope I have made a safe arrival. I think I see you hail me from the distant shore

"I join you welcome on our peaceful shore
My voyage ended & my perils o'er

Pleasures of the Senses

Before I proceed to these I will make a few observations
Since the loss of primeval innocence ~~I will~~ pain is the natu=
ral state of man, as the absence of stimulus is death, so is
the absence of sensation pain. Hence people constantly endea=
vour to experience sensation of some kind, some by tobacco
some by ardent spirits, Coffee, Opium &c

However pain is the natural state it is not necessarily
so Pleasure in civilized life predominates over pain, tho
in a savage state pain predominates, the first sensations
wt we experience I believe to be always painful. the pain
wt a new born infant discovers by crying I believe arises
from the stimulating effects of the air on the skin and
lungs, Every thing except the mother and milk is
painful

Dr Hartley is of my opinion he observes that sounds
wt are pleasant to us were originally painful & urges
the playing of a tune to an infant 8 or 9 months old wt
will infallibly set it a crying. These painful sensations
become pleasant by repetition

Pleasure resembles animal life. I shall treat first
of the pleasures of the senses and the mind

Secondly of that state of the nerves in wh pleasure consists or in other words the Proximate cause of pleasure. Many of the pleasures of the senses are important articles of the Materia Medica. Most of the cures said to be performed by nature in chronic cases result from Pleasure

I shall consider pleasure as an unit

Pleasures of the Sense of Touch the first of these wh I shall notice is a certain feeling wh is perceivable in perfect health called by an admired German writer the pleasure of self feeling. The pleasures of this sense are said to arise from the easy and natural order of the different secretions. The absence of pleasure is pain

2d The next pleasure of the sense of touch arises from the contact of the sexes. This is devided into 3 species 1st the commerce of the sexes 2d the act of kissing 3d From the contact of the skin in any part of the body. this last is very pleasing. hence the Italian Painter Amaiato in his beautiful and justly admired painting of Angelica & Medora paints them in the following manner. — Angelica is seated on a verdant turf Medoro with one of his hands squee=

zes one of hers while with the other he points and requests her to look at her name which he had carved on the bark of a tree. His knees are in contact with hers, his head gently leans against hers and his ankles are in contact with hers

Sir J Reynolds declared he would have given 1000 guineas to have been the author of the thought

3d A certain temperature of the air wh perhaps varies at different periods of life. this state of the atmosphere most frequently occurs in Italy, hence the raptures which travellers feel in passing thro that country. It occurs in England in the Spring months. I think I have felt it in this country in June. Sheep seem to delight in the shade of a tree in a warm summers day

The surface of the lungs is an extensive portion of the surface of touch. Breathing nitrous air produces exhilirating effects, but contrary to common opinion it leaves the system languid, this was proved by Dr Stoke Dr Woodhouse relates its wonderful effects in his edition of Chaptal. Dr Beddoes has proved that this sensation may be heightened to rapture by respiring deflogisticated nitrous air

4th The pleasures of the sense of touch are increased by the use of the warm bath, this was well known to the Romans to increase the pleasure they sometimes bathed in warm oil. The estimation in which this was held may be judged of from the costliness of the Baths, some of wh were of silver and ornamented very highly. Dr Franklin soothed the decline of life by warm bathing. he sat whole hours in it, it sometimes composed him to sleep

5th Source of pleasure arises from certain actions of the body wh are pleasurable as Hunting Dancing Swinging. Riding. Walking after a long rest

The chase is a peculiar source of pleasure to some, they enjoy more pleasure from this than from any other source from whence they derive this pleasure I confess I am unable to say. Can it be from the cold bracing them up as it were as hunting takes place usually in cold weather & the coldest part of the day (the morning) perhaps it arises from the echoes of the horns & the yell of the hounds from the neighbouring mountains; it cannot arise from the competition of the hounds with so contemptible & harmless

an animal as they pursue, from jumping ditches, leaping high fences &c

Most probably it arises from the reflection of the hunter, of having escaped with whole bones, what the Indians call the Joy of fear after a victory in wt they faced great danger

Under this head may be mentioned the pleasure of sailing both on water and in the air. Balloons will I hope become one day a common mode of conveyance. Mr Blanchard told me the pleasure is indescribable, it raises the pulse considerably. They may become a common article in the Mat. Med: In diseases of moderate action they will not be liable to the inconveniences of sailing on water

6th Another source of pleasure arises from the operation of certain medicines taken into the stomach. The alimentary canal I consider as a part of the widely extended reign of touch. As 1st a dose of opium gives a pleasing sensation to some 2 Stramonium this is roasted & used in the west Indies as we use Coffee 3 Tea 4th Coffee 5th Tobacco 6th Ardent spirits wine &c

7th A sudden relief from extreme pain, hence women after delivery have declared they felt as if they were in heaven Patients with Gout derive great pleasure from the

the sudden departure of a paroxysm. Humboldt says he derived great pleasure from getting out of the way of Musquitoes

8th Pleasure is derived from the application of soft substances to the skin as Eider down, fur, velvet, and some derive great pleasure from a feather bed

9th Certain titillations on different parts of the skin gentle friction of a soft hand on the leg is a most pleasing sensation to a sick person

10th Many people derive pleasure from peculiar Idiosyncrasies. I knew a gentleman who experienced a great degree of pleasure when his arm was bound up previous to B.S.

11th There are hermaphrodite pleasures as riding in a sleigh, this arises from a combination of the sensations of cold, the motion of the sleigh & the company

12th Pleasure arises in some measure from darkness & silence, here perhaps the body is in a morbid state this pleasure is to be attributed to the sense of feeling

13th The intermediate state between sleeping and waking is a source of pleasure

14th Scratching heads is a great source of pleasure to some I have heard of Ladies who wd sit whole hours to have their heads scratched, tho not a louse cd be found

To the history of the senses of pleasure already given I add the bodily pleasure sometimes attending death. Strange as it may appear that to die is pleasant, it is no less a fact in some cases. I have witnessed instances in wt persons felt no pain in dying. The agonies of death is a common expression, but it is not allways a just one

Adrian long ago spoke of the "pain the bliss of dying. Dr W Hunter in his last moments said to a friend at his bed side. I wish I had a pen & ink & could write that I might describe my feelings & record how pleasant a thing it is to die. Genl Butler who fell on the 4th Novemr 1791 at St Clairs defeat said he felt as if he was sinking into a pleasant & easy sleep. I saw a person laugh 3 or 4 minutes before death, he was naturally of a lively disposition. The placid countenance wt is observed in some dead persons and wt forms a strong contrast to the frown and agony wt appear in some others denote sufficiently the pleasure they felt perhaps in the prospect of a better world

Under this head I shall mention but one more and that

is the contact of the skin of an infant 8 or 10 Mo old. perhaps this is only exquisitely pleasant to Fathers. — Thus far I have considered the pleasures of the sense of touch. Motion is in some degree necessary to pleasure of this sense

Pleasure of Taste

Had our lives depended on reason for their support we shd die from negligence, but nature has warned us of our danger by giving us the sense of hunger, when we neglect to provide food. This sense is of a relative nature. It acquires addition from hunger, hence when urged by hunger we can make a hearty meal on food wch at other times wd be very unpalatable

Habit makes many things agreeable to the taste which were originally unpleasant. Thus Tobacco Garlic and Onions become pleasant by use. Hence the olla Potrida of the Spaniards is agreeable to them, hence also the French season their beef-stakes with Asafœtida

To relate the simple objects of taste wd require a volume not to mention their infinite variety when compounded & the methods which art has discovered to increase the pleasures of eating and drinking

The combinations of Condiments as vinegar &c &c become necessary to stimulate the appetite when it begins to flag and also to increase the pleasures of Taste by increasing the excitability of the papillæ. The Rhinoceros it is said does this by licking thorn bushes before he attempts to eat

The estimation in wh the pleasures of the table have been always held proves the pleasures of this sense. Fortunes have been spent in the single Item of good eating. I have suspected aliments to have the same relation to each other that sounds have. The richest food palls the appetite by habit. After recovery from sickness the pleasure of eating is exquisite

The pleasures of eating are increased by a concentration of sensation in the tongue wh abstracts it from the other senses

Dr Blackmore tells of a Patient who had an inflammation of his eyes wh partly arose from high living, the Dr told him of the danger he was in of loosing his sight if he continued the practice, he replied "I have seen enough Dr but I have not eat enough, therefore I will eat on at the expence of my eyes Heat is necessary to the pleasures of this sense, cold substances loose much of their sapidity

Pleasures of Smelling

Every hill, every vale, every rivulet & every shore, Every region of the world is tributary to this sense. There appears to be a scale of objects for this sense. There is something like bass in the Smell of the Magnolia & Tenor in that of the rose

and Pink, after these rank the Jessamine, the Jonquil, violet the sweetscented shrub wh partakes of the smell of the pine apple and the strawberry. Odours please by mixture. Contrast contributes to the pleasure of odours, thus after smelling fœtid odours as asafœtida &c the smell of fragrant flowers is much more delightful

Moisture contributes to render odours more agreeable hence in the morning and evening when the dew is on the ground, flowers smell much sweeter than in the middle of the day. — It wd seem as if nature intended that even the gratification of this sense shd be purchased by the labour of man, since flowers always derive fresh fra=grance frm transplanting them to a garden

This sense like the others is sometimes perver=ted. hence some people delight in the smell of tobacco asafœtida, the snuff of a candle, Musk Civet and other disagreeable odours

The nose may be made the medium of the ex=hibition of medecine. I have attributed much of the medical virtue of the Country air in many diseases to the fragrance of the flowers

Vision

Where shall we begin the pleasures we enjoy from this sense? or where shall we find language to describe them scarcely an object in nature exists but may be capable of pleasing our eyes. Light, Colour Figure Magnitude Height Motion &c all combine to afford pleasure to this sense

Light. Milton describes the pleasures derived from the beams of the moon broken into small shadows. The delicate tints of the moon is more pleasureable than that of the sun to most people. The eclipse of the sun in June 1806 excited pleasure

Colours A variety of colours afford pleasure, the azure blue of the sky, Green colour of the earth are particularly agreeable, the red orange violet and white also like sounds they are related to each other. The plumage of birds is delightful. In different substances different colours please best, as white & red in the human face so in metals a yellow colour pleases most, this has been explained by a supposed association of the value of gold with the colour, but this I deny. Give me an Indian who had never seen a peice of money in his life a coin of silver gold & copper, he will invari=

=ably choose the gold one, white is next, he will prefer silver to copper. Variety in Colours is very agreeable as in the rainbow

Colours I have said are related, they have a greater or less affinity for each other, hence the phrase "Such a one dresses with taste" only means such an one suits the colours to his complexion. It has very little dependance on the fashion of the cloaths

3d We derive much pleasure from figure. According to Hogarth figure pleases in proportion as what he calls the line of beauty occurs more or less frequently in it. It is a particular curved line wh occurs most frequently in the human figure hence man is the handsomest animal in the creation & the pleasure is great wh arises from beholding the human figure whether male or female

The next animal in beauty is the horse. Hence too we feel more pleasure in viewing a steeple than a plain mansion. The line of beauty occurring more frequently than in the former. hence

also a bow room is the handsomest

Gentle Motion The nodding forest, the waving corn field, the gently purling stream and the rolling waves all afford pleasure. motion to please must be slow, hence Milton describes the angel in Eden as "slow moving without step" hence the pleasure of viewing a country dance Sir J. Reynolds calls a bad education the school of deformity

Height, Distance and Magnitude so frequently united strike us with pleasure

Extravagant pleasure like grief strikes us dumb. a lady who had reached the top of mount Blanc in Switzerland where she had a prospect of 60 miles beneath her eye, villages castles, ruins, mountains rising over mountains & topt with forests, was so struck with awe at the prospect that she fainted away. Mr Brydon describes his awfully pleasing sensations from the eruptions of mount Etna wh cast a light for the distance of one hundred miles

Mr Bruce describes too the awe with wh he awe=wed the immense cataract of the Nile

The spirit of Queen Sheba died within her on beholding the magnificence of the temple of Solomon

Height itself imparts pleasure, hence the pleasure we feel on viewing the moon & heavenly bodies, the ascent of a balloon &c Combination of colour & motion increase our pleasure in viewing distant objects, – as a flag on a mast head, – A cloud tinged with shades. What can be more sublime than a prospect of the sea agitated by a tempest and viewed from the shore Contrast adds very much to the pleasure of seeing hence lord Kaimes observes that a garden in a forest should be as regular as possible, but in a city wild and ~~romantic~~ irregular

Genl Koscuisko's aid de camp told me that the sight of a green leaf gave him the greatest pleasure he had ever experienced from looking at any object, immediately after being set at liberty from a confinement of 2 years in the jail of Petersburgh. The pleasures of this sense are relatively connected

Pleasures of Hearing

From our entrance into the world we are besieged with pleasures from this sense. Perhaps no sound can be possibly more pleasing than the human voice tho

habit has rendered us almost insensible to its charms, our mothers voice is the first ~~thing~~ sound we hear & nothing pleases us more. Public speakers I am persuaded charm us more by the melody of their voices, than by their eloquence. Such are the powers of music both vocal and Instrumental that the heathen poets tell us. hell has been made to open its gates & render up its prisoners. And we are taught from Revelation that the gratification of this sense will form a part of the happiness of a future state

The charms of music might be proved from the enormous sums lavished for the gratification of the ear. Count Oreski a Polish nobleman used to spend annually £ 25.000 in musical entertainments. Innumerable are the sounds wt salute our ears, the winds, the feathered tribe, the lowing of the cattle, the hum of the bee, the purling stream &c &c all afford pleasure to this sense. a proof Gent that the deity never intended pain to predominate over pleasure. See Dr Price on this subject

Much has been said about the equal rights of man how far nature intended man to be an an equality in other respects I will not pretend to say. But in the distribution of the senses she has had no respect of persons. The hungry beggar experiences as much pleasure in dining on the offals of a rich mans table, as the king who

dines on the most sumptuous fare. The clown experiences as much pleasure from the coarse sounds of the Banjer as a Nobleman does from the most expensive concert

Our evils do not proceed from the fountain of good, but from the folly and wickedness of man

I have now considered the pleasures derived from the various senses & recommend them to your candid attention. I consider the body of man as a violin, his senses I compare to the strings. Every thing that is sublime in nature is the bow. The supreme being is the grand mover of the whole machine

Proximate Causes of the Pleasures of the Senses

The suspension of one sense increases the power of another, when I treated of sensation I observed some are increased others diminished by repetition. Also no two sensations of equal force can be coexistant. An ignorance of this has led the votaries of sensual gratification to enjoy several of the sensations at once as eating, music &c. They are either enjoyed in succession or else from their combination a new sensation results. In the same way as

green results from the combination of yellow and red

Motion is essentially necessary to Pleasure, the objects of all the senses excite motion

<u>Pleasure Consists</u> 1st In a certain definite limited & regular degree of the same impressions 2d In a certain regular order of motion, the pleasures of taste & smell are of the shortest duration. To render the above observations plain I must speak of the <u>Causes of pain</u>

1st Distension to a certain degree, producing a tendency to mechanical solution

2d A certain degree of contraction in parts previously relaxed

3d Certain Chemical or mechanical stimuli

Pleasure & pain are related to each other. The ancients were well acquainted with the relationship of pleasure & pain. In the fable of Socrates they are said to be twin sisters

The words of a well known song give testimony to this affinity

"Those dear eyes how soft they languish
"Fill my heart with rapture beat
"Pleasure turns almost to anguish
"When the transport is so sweet

Pleasure then consists in certain vibrations of the nerves wh are harmonious, regular &c in a definite degree Pain is a greater or lesser degree of those vibrations or an inharmonious number of them

A high degree of distension produces pain a small degree pleasure, as for instance opium in large quantities produces pain in small quantities it excites pleasure also the warm bath this of a moderate temperature is highly pleasing, increase the temperature and pain is the consequence. Exercise when excessive produces pain and fatigue, but in a moderate degree is highly pleasing Relaxation or debility in a high degree invites pain in a more moderate degree it is pleasing rest after labour is very agreeable; sensations after child birth are highly pleasing. Ease from severe pain as colic &c

An excess of stimuli that are pleasureable in a small quantity is painful. Excess of light offends the eye in a moderate degree it is pleasureable

Certain impressions in some people, from a peculiar Idiosyncracy, occasion pain wh in others excite pleasure. Thus I knew a Gent who had the sensation

in his fingers so acute, that the contact of a soft substance wh wd please every body else was to him the most exquisite torture

Rough bodies give pain, smooth ones give pleasure to the body by exciting an harmonious vibration of the nerves wh the rough ones could not do

Certain sensations are of a mixed nature partaking both of pleasure & pain, as tickling the soles of the feet, certain stages of hysteria. This depends on the predominance of the pleasant and unpleasant alternately

The pleasure of each of the senses will require a specific explanation. Mr Reid supposes the variety of tastes of sapid bodies, to depend on their mixture with the Saliva.

May not the variety of sensation of the other senses be produced in the same way by certain mixtures of harmonious & unharmonious vibrations of the nerves of the part. How does the human face impart pleasure to our eyes, but by the reflection of certain rays of light exciting harmonious vibrations on the nerves of the retina & how does deformity pain us, but by reflecting the rays of light in an unharmonious order

When impressions become painful they are inc=

regular. — Women are said to possess the most fortitude in bearing pains, perhaps they have, but I believe it is owing to their nerves attaining a paralytic state sooner than those of men. Pleasure like pain is lessened by duration Dr Haller says pleasure is the result of the afflux of blood to parts. — In generation this may be the case & perhaps in one or two more instances, but it does not take place in all the acts of sensation. Some say the proximate cause of pleasure is relaxation in these there is less blood than at other times

Why does a certain order and degree of ~~pleasure~~ impression produce pleasure? Because it has pleased our creator to form our bodies so as to render us susceptible of pleasure from these impressions

But we have one difficulty to encounter and that is. That some sensations become stronger by repetition while others loose their force. Of this first we mentioned an instance, in dropping water on the head. Of the second Tobacco Ardent Spirits & opium afford us familiar examples. Besides all pleasing sensations loose their force by repetition. It is the will of the Creator that it sh

be so, to make us seek the enjoyments to be derived from the mind wh are more durable. From all that has been said we learn that pleasure is a mere quality or effect depending upon the peculiar organization of animal matter wh renders it capable of receiving certain impressions from stimuli

Certain sensations originally painful become pleasing by habit. To explain this I have said that pain depends upon the excessive action of impressions. wh when moderate & in a certain order produce pleasure. I have said also that strong impressions become weak & vice versa. — Now in this conversion of strong to weak sensations depends the pleasure derived from impressions wh at first were painful as Tobacco Opium &c. There in 99 cases out of 100 are all unpleasant at first, but by repetition they act less forcibly & thus induce pleasure

From this view of the subject we can believe in the pleasure wh people formerly took in viewing the contentions of gladiators. And the delight which tyrants take in shedding the blood of their fellow creatures. The impressions wh these

sights at first made were no doubt painful, but by repe=
tition came down to the pleasureable point

Pain from duration wears itself out, constant pain is contrary to nature, hence the reason why women bear pain best, because their nerves sooner take on a kind of Paralysis

Pleasure from duration becomes less pleasing. The pleasures of all the senses are diminished in old age (Taste is an exception to this) The feebleness of impressions is the cause of it

But one sensation can exist at a time. Hence martyrs feel no pain amidst the flames. The more powerful sensa=
tions are those of their minds & the corporeal pain is not perceived in the prospect of the joys of a future state. Hence too persons have been relieved from a fit of the Tooth ache or other slight indisposition. So that this is as useful a truth to christianity as to the Animal Oconomy

The same nerves are fashioned to sustain
The highest pleasure & the greatest pain

Final causes of the Senses

The senses are calculated to preserve the state of our existence. They induce us to eat & drink. they prompt us to the propagation of our species. They drive us to our beds & force us out in the morning to the business of the day. It appears that the ultimate design of the creation of man was universal pleasure Our senses invite us to explore the works of nature or art They should be the only avenues thro wh we sh^d arrive at the fountain of happiness. The pleasures of the senses are not durable. They cannot be enjoyed without health. They are untuned by disease. They are so nearly related to pain that they often change into pain

1st What are all the delicacies in the world to a man labouring under gout. Good health is absolutely necessary for the enjoyment of the pleasures of the senses. what are all the beauties of nature to a man affected with melancholy or hypochondriasis

2^d The pleasures of the senses are of a limited nature, too much of it fatigues the mind

3^d They are connected with pain and no fatigue is so great as that wh follows the too great enjoyment of sensual pleasure.

4th All sensual pleasures are of a short duration. By enjoy=ing them in the beginning of life, old age comes on and imp=airs the relish for them & finally the grave the utter extinction of them

By this wise provision of the creator, men are directed to search for the more substantial and durable pleasures of the mind of wh I shall next proceed to treat

Pleasures of the Faculties of the Mind

I shall first treat of the pleasures of the faculties when exercised in ourselves

2d When exercised upon others

3d Of the proximate cause and lastly of the final cause

Pleasures of Memory

By this faculty we live as it were our lives over again & enjoy in old age the pleasures of youth Nor is this all, by means of this faculty we command the suns that have gone down to rise again. We review by the assistance of this fa=culty the scenes of antiquity. We converse with our absent friends We view all the wonderful works of nature and art in every part of the globe. By our firesides we review or recall all the battles fought on the ocean & combats in the field, for ages long past as well as those of the present day. I refer you to Rogers's little poem on this subject. While we are

= able to reiterate the pleasures of memory we are unable to recall the pains that are past. True bliss & true happiness being the primary object of the life of man. This faculty gives to absent objects the vivid light of real present ones

Imagination

Mr Aikenside as well as Mr Addison have observed of this faculty that it endows us with a creative power. At one time it wafts us to the highest pitch of military or Literary fame, next it raises us to the pulpit, where with all the graces of oratory we excite by our eloquence the wonder and admiration of thousands who listen with rapture to the accents of our voice. At one time it wafts us across the ocean & enables us to view the curiosities of all Europe, whether the productions of nature or art &c &c

Understanding

The pleasures of the understanding are of a most sublime and elegant nature & of the most delicate kind. Truth is so natural to the human mind that it cannot be discovered without pleasure

Archimedes when he had solved a difficult problem could not help exclaiming in the midst of a large com = pany Ueche" Ueche"

Dr Rittenhouse fainted on observing the transit of Venus over the sun in 1769

Lord Mansfield said that while engaged on the bench he never felt hunger or thirst

The pleasures of taste are to be attributed to the understanding, as that of the disposition of colours in painting

Octavia we are told fainted on hearing the lines in Virgils 6th Aneid wh predicted the future glory of her son

Tho the acquisition of knowledge gives pleasure, ignorance does not produce pain

Wise men delight in wonders to explore
Fools are content because they know no more

Will

The pleasures of the will consist in the mysterious connection between free agency and necessity. We are delighted with what we understand but we admire something from necessity. Admiration is necessary to the human mind

The stimulus of admiration is necessary to the moral and intellectual happiness of man. There is no admiration without mystery. Something unintelligible must exist in the sciences to render them pleasing. The pleasures of free agency are increased after being long deprived of them

The pleasure wh we derive from a belief that the will acts from necessity is of a mixed nature

The pleasures of liberty, that blessing for wh oceans of blood have been spilt are owing to this faculty So great are the pleasures from unexpected liberty that it produced fainting in a negro who was unexpectedly set at liberty

Passions

It wd require volumes to describe the pleasures we derive from the passions. Even the most blameable of them, ambition, avarice and revenge have their pleasures, tho they are of a mixed nature. Hope Friendship &c are exquisitely pleasureable & pure love creates a little heaven on earth

The domestic relations of a family are fruitful sources of pleasure. Children excite pleasure in persons not related to them. This is almost general

Dr Priestley was impressed with the pleasure derived from children. he heard a man say our saviour never smiled. He declared it is no such thing, he must have smiled when little children were presented to him for his blessing

Married women live longer than old maids and batchelors because they derive more stimulus on account of their connexion. Hereafter I shall speak of ~~these diseases~~ this stimulus in the cure of some diseases

Moral Faculties

What shall I say gentl: of the moral faculty. It wd require a quill plucked from an angels wing to give this subject the colouring it deserves. — The pleasures of this faculty do not result wholly from acts of Justice, there are pleasures which arise from malice Anger &c. In partaking of unlawful pleasures, man enjoys the moral faculty in common with his brethren, the tenants of the lower regions

These faculties like the senses may be perverted, hence the desire of revenge which many possess, pleasure in the torture of animals and even their fellow creatures. Thus also a person in Paris during the revolution declared that the sound of the Guillotine, when cutting off the heads of 20 or 30 of his fellow creatures a day was the most delightful music he had ever heard. A member of the British parliament used to go in disguise to every execution in & about London & get as near as possible to the Gallows

These pleasures do not belong to the mind in its natural state. They are the result of diseased faculties

Probably in Agriculture the pleasures of the moral faculty are most perfectly enjoyed &c &c

I might here speak of amusements as cards dice &c Some of them afford great pleasure. perhaps they are a pleasure from the senses and mind

Love is increased by dancing. Friendship over the bottle &c

Pleasures of Appetite

Here all the faculties are gratified. This is born with us it differs in different men. The rich Citizen. The warworn soldier & the storm beaten marinus all differ in their appetites. But all please themselves with a hope to end the troubles of their lives by cultivating a small spot of earth. No enjoyment is more congenial to the taste of man. The pleasures of

the senses & of the mind often become subservient to each other
The pleasures of the table often unite with the pleasures of friend ship, dancing with love. A relish for the pleasures of Agriculture is born with us. A house, a farm & a classic ~~school~~ book revive in our mind the Idea of a country school A Drum a fife & a musket remind the soldier of the different exploits of his younger days

Pleasures of Consciousness

These are derived chiefly from a sense of our existence & our personal Identity. No man ~~wi~~ wishes to change his mind for another. Most men like to be just what they are

Pleasures of exercising the faculties of the Mind in other people

Eloquent speakers excite pleasure in their hearers. An acute strong and penetrating judgement is a source of pleasure to others. we are pleased with the operations of the will in others, whether in free agency or necessity. The former we call independance of mind. We are displeased with a man who is said to have no mind of his own

A Physician acquires fame & excites pleasure in others by attention & Judgement

Our highest enjoyment arises from the action of the Moral faculties in Justice & religious duties

Proximate Cause of the Pleasures of the mind

In our lectures on animal life, perfect life I said consisted in the mutual action of body and mind

1st The fatigue of the memory and Imagination proves the action of the mind on the brain

2 It is proved that the mind acts on the body by raising the pulse. Hemorrhages from the lungs and nose in affections of the mind. And the facts related in the Memoirs of Animal Magnetism

3 Dejection of spirits fainting & Hysteria prove that the mind acts powerfully on the nervous system

4th The discharge of urine from persons under the impression of fear and of Bile from those who are angry prove the effects of the mind on the alimentary canal & on the stomach as vomiting & diarrhea often accompany the increased secretion of bile

5 But particularly on the glandular. The liver and kidnies secreting a greater quantity than usual

The proximate cause of the pleasures of the mind like those of the senses depends on a moderate degree of contraction a distension on stimulus undue contraction and distension occasion pain

If the pleasures of the mind are owing to an harmonious order of vibrations excited in the brain in the same

manner as of the nerves. Joy love & other passions are evidently accompanied with distension. While probably in hypochondriacs & some other diseases of the mind the brain is in a state of relaxation

The Final Cause of the pleasures of the mind is to increase the activity of its faculties, by the acquisition of knowledge to lead us to search for real happiness & be good

It is an eternal and unchangeable law of nature that we shd enjoy the pleasure of the senses

Repetition blunts the excessive action of the faculties of the mind, as in the senses. A fond mother will visit the grave of a darling child, after some time not only without pain, but with highly pleasing tho melancholy sensations

On the senses I mentioned that Tobacco & by repetition becam agreeable. So by a happy constitution of our minds impressions originally painful become agreeable by habit

An Ugly woman is more endearing to her ~~husband~~ Lover than a handsome one. At least the impressions made on a man by an ugly woman are much more durable than by a handsome one

The first question I would ask in a love case wd be, is she handsome or ugly? If ugly little hopes. Dr Horne relates the case of a man who could not think of death & Judgement without the most terrible emotions. By retiring every evening to think on

the subject, in the course of time, instead of being painful, it was one of the greatest pleasures of his life

Is not this a strong argument in favour of our opinion that pain was never intended by God to predominate over pleasure or evil over good? And is not the only reason of our not enjoying subject happiness here, that we may be directed to the true source of eternal happiness

Sleep

The impressions which increase sensation or thought, wear down the excitability of the system & render sleep necessary In the sleeping state there is an absence of sensation and thought. Sleep is then to sensation & thought what rest is to motion & darkness to light. It is as necessarily alternate with the waking state as light is with darkness

In treating of sleep I shall consider
1st The Proximate cause
2d The Remote causes
3d The phenomena wh occur during sleep

Sleep has a tendency to death in the absence of sensation & motion. It has also a tendency to life as the excitability is increased by it & the excitement equalized

Sleep occurs naturally when the system is debilitated or reduced to what Dr Brown calls the sleeping point

Dr Cullen supposes this to consist in a collapse of the Brain during sleep. As I said before an equilibrium takes place between excitement and excitability & sleep never occurs when the system is depressed below the sleeping point or when raised above it. This depends on a greater or less degree of stimuli to which we have been exposed during the day. If we have been exposed to much fatigue we raise excitement at the expence of excitability & sleep is necessary for the restoration of the equilibrium

1st The proximate cause depends on a certain degree of depression in the brain by the accumulation of blood in its sinuses. A gentle pressure on the Brain sometimes produces sleep

The nerves cease to communicate sensation and the mind to act. The sleeping point I consider at 20 the Wakefulness at 10 above or 10 below

The causes wh induce sleep are such as act

1st By the abstraction of certain stimuli

2d By such stimuli as expend the excitability of the system

3d By such as elevate the system to the sleeping point

If the system be below the sleeping point stimuli are necessary to raise it. As opium Tea &c If it be raised above the sleeping point it must be reduced to it by evacuations

To the first class belong the abstraction of light 2d Purging Bleeding & other evacuations 3d Substances applied to the body as oil &c 4th Cold death from cold is always preceded by sleep 5th Gratification of the venereal appetite 6th Cessation of pain, women after delivery often fall asleep 7th Sedative passions as Grief, excess of Sympathy

<u>The Remote Causes of Sleep</u> are divided into such as raise the system to the sleeping point and such as reduce it to the sleeping point. The former act directly the latter indirectly. These last are as follows

1st Labour induces sleep

2 Moderate stimulus of aliments & drinks as wine ardent spirits, Opium, Tea Coffee & other narcotics. they raise the system to that grade of debility which is the point. I wish here to notice the relative effects of tea, it prevents & likewise induces sleep when the system is at or above the sleeping point, it prevents sleep & vice versa

Phlogisticated air probally acts in the same way in crowded assemblies

3 Certain sounds induce sleep by direct stimulus

4th Moderate warmth by raising the system to the sleeping point induces sleep

5 Certain acts or exercises of the mind, such as thinking on

an interesting subject

6th The stimulus of light often induces sleep

In order that the 3 classes of stimuli should induce sound sleep they shd act on the Brain Nerves Muscles & Blood=vessels in an equable manner. Thus if there be too much excitement in the bloodvessels, perfect sleep is not induced unless there be certain medecines employed to restore the equilibrium. Opium is most proper when the nerves brain & Muscles are all below par or equable excitement.

Such as produce sleep by reducing the system to the sleeping point are

1st Abstraction of certain stimuli, light. sensation and muscular motion

2 Certain evacuations Bleeding Purg^g Vomt^g &c Wh produces sleep by bringing the bloodvessels into an equality with the Brain in action

3d Certain substances applied to the body as oil also cold air

4th Gratification of the venereal appetite

5th Abstraction of pain, hence women sleep after child birth.

6th Sedative passions. Also constant thinking on any par=ticular subject. Convicts who are sentenced to death often sleep well the night before their execution. We will not be likely to produce sleep by medecine ~~applied~~ adapted to all

the systems if the brain be much excited, here conversation will do harm. The knowledge of these facts is necessary to make a scientific physician

These are the means of seducting stimulus when we are excited above the sleeping point. Those wh act by raising the system from a state of direct debility to the sleeping point are

1st Gentle exercise as walking, rocking in a cradle

2 The moderate use of aliments and drinks. Opium Tea Coffee &c. These must be regulated as to quantity for too much will raise the system above the sleeping point

3 Certain sounds to wh we are accustomed, Thus a watchmaker cd not sleep without 20 or 30 watches ticking at his head. The inhabitants near the falls of the nile cannot sleep when from home

4th Moderate warmth of bedclothes Pediluvium &c

5 Certain acts of the mind as thinking on an interesting subject. Sleep may be induced by counting 100 backwards

6th The stimulus of light frequently causes sleep. sick people often fall asleep at break of day and probably from this source

Thus I have explained the causes wh induce sleep & the 3 different modes of this action

1st In the case of indirect debility
2d By the subduction of stimuli
3d By raising the system to the sleeping point

Morbid Sleep

Opium wine Tobacco &c taken in undue quantities accumulate blood in the sinuses of the Brain & occasion morbid sleep Azotic gas acting on the brain. The sleepiness induced in crowded assemblies is partly induced by the azotic gas acting on the brain, this sleep is morbid. It differs from natural sleep in not being accompanied with an expenditure of the excitability of the system. It is by forcing sleep with opium that so much mischief is often done with this medecine

Phenomena of Sleep

1st Sleep comes on with a tickling or pricking pain in the eyelids & sense of weight. So that we can with difficulty keep them open. Pain in the limbs is the next perceived symptom, this in young children is frequently so acute as to make them cry out. It is caused by debility of the indirect kind wh invites morbid action to the muscles. It is caused by ~~debility~~ fatigue of thinking &c &c as well as by bodily fatigue & then the intellects are first affected. The head totters first, then the whole body takes the horizontal posture wh is best adapted to sleep. In some cases we start in our sleep this is oc=

casioned by too sudden abstraction of sensation & motion

There is a certain order in wh the senses are closed against all impressions. the eye first refuses to act, next the taste, smell hearing lastly the touch. That the sense of touch reposes last I infer from our changing our situation so often in bed. This sense seldom reposes completely

There is a difference in the order in wh the senses repose occasioned by Idiosyncracy. In some the sense of smelling and taste do not repose

The muscles like the senses retire in regular order, those of the arms and legs first, those of the head next, those of the back last. In some people this order is reversed. Thus some sleep while sitting, some when standing. We see some ride and walk while sleeping as somnambulists. The night before the battle of Princeton a number of the officers & Soldiers slept in their march and were round by the firing of the cannon

Sleep sometimes occurs suddenly on account of the sudden abstraction of stimulus. The different systems of the body like matter of heat has a constant tendency to an equilibrium

In sleep there is 1st a loss of motion in the muscles of the limbs

2d Suspension of the sensations, hence in stone in the bladder

there is very little pain. The relaxation of muscles is owing to this cause

3d Diminution of irritability

4th The involuntary motions become slower, as respiration, the action of the heart and arteries. The pulse becomes slower and fuller. The arteries seem to derive a portion of excitability from the nerves The arteries seem to act as sentinels to the body. The peristaltic motion of the bowels is lessened in sleep

5th Secretions are increased during sleep, as the urine & Bile. There are two powers in the animal Oeconomy wh govern it as in the planetary system viz Centrifugal and Centripetal

6th The excretions are diminished during sleep. hence Diarrheas are less violent. The suspension of the excretions during sleep is the reason why some people get fat

7th There is a diminution of the heat of the body during sleep. This probably arises from the abstraction of the stimulus of muscular action & perhaps the confinement of the bed clothes may contribute to their relaxation

8th The system is reduced in strength in sleep, or more excitable, hence gout & Epilepsy and other diseases make their first attack at night. I wish you Gent to remember this

9th More heat is necessary to preserve life in the sleeping than in the waking state 12 degrees of Fahrenheit will

destroy life in sleep. But an animal can resist a much greater degree of cold when awake

10th The duration of sleep is different in different persons. Children sleep more than adults & abortive children sleep more than others. Studious men sleep more than labourers. Carnivorous animals more than herbivorous because the food of the former is more nourishing. Old men sleep more than middle aged, till they arrive at second childhood 8 hours in the 24 are sufficient for middle aged persons to sleep More is morbid

Wesley and Whitfield slept only 4 hours. The king of Prussia between 4 and 5 hours

No man of great talents is ever a great sleeper. A man who slept with Mr Whitfield declared he slept more in 4 hours than other persons do in 8, he slept so sound

When sleep is perfect there is no consciousness of the lapse of time, a moment & an hour appear the same. I have heard of a man who slept 14 hours and when he awoke supposed he had only taken a short nap. We are told of a man who slept for 10 years, but I do not believe it. Persons who sleep little at night are torpid It is easier for us to awake than to fall asleep

The causes which induce waking, are light, sound &c &c we awake regularly from habit

The mind first opens from its repose. vision is restored, at length all our senses are roused into action, thus the Equilibrium is restored

We wake more suddenly from a nap in a chair than in a bed. From an abstraction of stimuli at night the system is weak in sleep. Invalids therefore ought never exercise before breakfast; as the system is very weak in the morning. The Indians know this hence they attack their enemies at break of day

Nature to remove this debility has filled the air with odours &c in the morning

Handsome people look less beautiful immediately after rising, than they appear at midday or in the afternoon, these things Gent ought not be forgotten

The Faculties are differently operated on in the morning from what they are at the other periods of the day the Faculties seem to arrange themselves in order by specific gravity

The Understanding is brightened in the morning hence the fruits of morning studies are easily distinguished from those that are said to smell of the midnight lamp

The moral faculty is most perfect and awake in the morning. hence rogues seldom commit frauds in the early part of the day, hence it is the best time to make a bargain

Dreams their causes & Phenomena

From a careful examination, I am induced to believe that dreams are not necessarily connected with sleep. Some people never dream, I knew a man who declared most solemnly that he never knew what it was to dream. Mr Stewart the great pedestrian traveller says he never dreamt when he lived on vegetable diet. Mr Locke says the mind & the body sleep together

If dreams were necessarily connected with sleep I wd say with the poet "how blest are they who sleep no more"

Dreams are morbid phenomena in the mind & depend on irregular excitement. When the mind is in equilibrio there is perfect sleep & no dreams, you seldom hear of dreams in a farm house, this is owing to the fatigues of the system inducing that state of the system wh produces perfect sleep. If a dream chance to be produced it serves as an amusement to the family for several days. Common mo=tions in the brain are mechanical, thoughts are intellect=ual, the first are performed by brutes as well as by men the latter are peculiar to men

Our senses are often perverted in dreams. Delirium is an action of incoherent thoughts or delirium is a higher grade of dreams & dreams are a lower grade of delirium

The dreams of debilitated persons are always very

distressing. Dreams generally consist of visible Ideas, for we receive more Ideas by our eyes than by any of the other senses. With our eyes we often see objects whether we will or not, but there are certain sounds by wh our ears are not at all affected.

Men never dreamt any thing which did not enter the mind by the senses, & hence the truth of the saying Nihil est intellectu quod non prius fuit in sensu. In study we endeavor to shut our senses against all impressions wh wd not favor our study. hence some men prefer solitude for study, & some like darkness. The faculties of the mind sometimes act with increased vigor in sleep.

The Memory is often excited in dreams. Thus many things are revived during sleep which appeared to have been forgotten. Ideas are sometimes recollected in dreams, which are not afterwards recognized. A Widow who was sued for a sum of money thought she had paid it. She dreamt shortly after that her husband came & told her of a drawer in which she wd find the receipt. She went to the drawer & found it. Now it is highly probable that during life her husband had actually informed her of the matter altho' she had forgotten it.

In many

In many dreams the moral faculties are asleep. We often dream of committing deeds, which when awake we shudder at. How difficultly do we distinguish persons in sleep, owing to the imagination not acting regularly? How frequently do we dream of the person of an old friend, & are with him in idea, transact a hundred things together, & not recollect that he has been dead a long time? How different are our ideas of right & wrong owing to the sleeping of the moral faculty: hence our vague ideas of moral obligations in dreams.

The Understanding is often excited in dreams, hence eloquent speeches are uttered in a dream. The unfortunate Mrs. Robinson one day saw a maniac out of her window, at night she had occasion to take a dose of laudanum: this acted ~~so~~ powerfully on her brain, & during its operation she got up in her sleep, & in this state dictated to her daughter who slept in the same bed, that eloquent poem called the Maniac. When she awoke she was altogether ignorant of the transactions of the preceding evening.

The Will acts preternaturally in dreams

We often aim a blow at our supposed enemy in sleep. A Methodist Minister was sleeping with a mischievous lad who thrust a pin into his back; he instantly exclaimed "Oh! now I know what St Paul meant by a thorn in the flesh". Doct. Beattie relates the case of a young military Officer, who having some insulting words whispered into his ear during sleep, rose from his bed & went through the usual forms of a Duel, & was awakened by the report of a Pistol put into his hands which he imagined he had fired at his antagonist.

Fear and the different Passions are excited in dreams. Children wet their bed under the influence of dreams; this is owing to the great irritability of the bladder, which being less in old age, people advanced in life seldom wet their bed.

The Sexual Appetite is excited in dreams. Appetite for Food is excited in dreams. The loss or diminution of one sense is followed by the increase of another. So it is with the faculties of the human mind, some people have lost their veracity by relating strange tales, which have only passed

in their imagination during sleep.

Lovers never dream of each other but at the beginning and end of their loves.

Do we always dream? this, gentlemen is an important question. in it the sleep of the soul is concerned. I know a lady in this city who never had a dream in her life altho' 70 years old. Mr Stewart never dreamt when he lived on a vegetable diet: but animal food made him dream.

Mr Locke says that he does not believe that we always dream. I would for my own part as soon believe that a fever exists constantly in the blood vessels, as that we always dream.

According to Mr Locke the soul & body sleep together, which I believe.

Dreams are not common in the decline of life - they often occur in children, and in old people during sickness. Mr Stewart relates the case of a man who had a blister on his head, during his operation he dreamt of nothing but losing his scalp by the Indians. Very important secrets have been divulged in sleep. A Lady of this City related to a female when asleep, her love & attachment to a young Gentleman; doubtless she would not have

told the same to any person living when awake

Morbid action in the brain is sometimes so great as to influence the muscles of the limbs, hence the cause of Somnambuli or Sleep walkers.

Somnambulists.

The Revd Mr Bradlock of Edinburgh one evening retired to bed before the rest of the family & fell asleep. The family as usual assembled to supper. the old Gent: got out of his bed in his sleep, put on his clothes, came down stairs, where he eat & conversed as usual, of a sudden he started up in a fright, asked where he was, and declared he knew nothing of what he was doing. His veracity puts the truth of the account beyond question.

A Young Man in Paris, is said in the memoirs of the french academy to have composed an oration in his sleep. Somnambuli when awake never recollect any circumstances that occurred while they were in that state, but in the next fit they recollect every thing. In a letter to Doct. Stiles a case is related wh perhaps may afford a clue by which this disease may be accounted for "A Young man by standing a great deal in Water, had a curious disease brought on him. It is a

kind of fit which seizes him frequently, and at different intervals. When the fit seizes him he falls down but soon rises; but what is more remarkable is the extraordinary state of his mind; if he wishes to do any thing he sets about it, & frequently the fit goes off in the midst of his labor, he forgets then all about it, & proceeds to do whatever he was engaged in previous to it. But at the same time, when he is taken with the fit he forgets all his business & proceeds with what he undertook in the other fit. So that in short he appears to have two minds, one he uses only in the fit, & the other during the intervals: they act independently of each other."

Probably the motions of the Somnambulists depend on two minds, two spots in the brain; the seats of the two minds may have actions independant of each other, & each may have a Memory, Will &c

Somnambulists never recollect any of the actions performed during Sleep. perhaps the force of the impression is not sufficient to excite the memory & rouse it from its sleeping state. The same thing obtains in Mania. A person who gets the name of being a King in one fit of Mania, will forget

it entirely if he be cured, and if he relapses the same idea will return with the disease.

Drunkards perhaps have the same kind of recollection. A fellow student of mine, together with myself one afternoon at Edinburg in company with John Brown, since Doct Brown. by small drinking, my fellow student became intoxicated so that I led him home. As we walked along he spoke french very fluently. The next morning when in Doct Cullen's lecture room, I told him I never before heard or knew that he spoke french, he was surprised & declared he had not spoken the language to his knowledge for several years, for he had entirely forgotten it.

It is remarkable that somnambulists never feel fatigue from exercise ~~performed~~ performed during their continuance in that state. It evinces the existence of morbid excitement in the brain

Lovers seldom dream of the beloved object, but at the commencement or decline of their love, owing to the stimulus of thinking constantly on the beloved object wearing down the excitement of the brain

Dreams then are not the effect of supernatural agency I by no means however intend to shut up the channel thro'

which the supreme being in certain cases directs the human mind

I have now attempted to consider the phenomena of sleep and dreams, the subject is worthy of your attention all the senses are dormant in sleep

And it may be asked why this partial death

1st Sleep serves to restore in a certain degree the equilibrium of the body, a greater quantity of excitement is collected in the blood vessels during sleep. Sleep acts by equalizing the system

2 Sleep affords the power of producing excitability in the system

3 Sleep favours the assimilation of food and nourishment of the body

4th To the mind it affords oblivion of cares, gives refreshment and fits it better for the business of the day

5th Sleep restores all the faculties to their natural order

6th Sleep dissolves false associations of Ideas and produces co=herence, abstract sleep from those whose faculties are used to be excited and madness will follow

7th Sleep arranges the moral faculties, the night is the time when frauds are committed, few rise in the morning to do evil

Take away hope and sleep from a man and you make

him the most miserable being on the face of the earth

Say not with Cervantes bless the man who invented sleep, but bless the Creator of the world for this cordial balm as the Poet has elegantly called it "Tired natures sweet restorer"

It wd seem as tho we partook of the nature of a clock, we require winding up once in every 24 hours. Study without rest is the greatest inlet of disease

<u>Uses of Sleep</u> 1st It seems to support animal life during the abstraction of those stimuli wh attend the waking state

2d It serves to dissipate an undue accumulation of excitability

3d It serves to indicate the existence of certain diseases

Galen relates the case of a man who fell asleep and dreamt that his leg was turned into stone when he awoke his leg was paralytic. I have no doubt that the man actually felt a pain in the leg, before he went asleep else he could not have dreamt as he did

Here gent I take leave for a while of the faculties of the mind in a sleeping and in a waking state

I proceed to consider in what manner the sensations are recruited. It is in two ways, by the use of aliments and drinks. By these social intercourse between different people is preserved and these seem to keep in our minds a knowledge of our necessary dependence on the Supreme being

We have so much toil that something is necessary to pre=
serve the Machinery of our bodies in motion, without
these our bodies wd become torpid and die. Let us sup=
pose that the people of this City were deprived of their
appetite for six months, what wd become of our agri
culturists. Idleness wd be universal, and the time
which was once honestly employed by the farmer &
the citizen wd be spent in vice

The air we breathe cannot be seen nor can it
be felt after a time by our lungs, but this is not
the case with our aliments

Our Creator seems to inscribe one every meal
we eat "When this you see
Remember me

Causes of Hunger

Dr Boerhave says the causes of hunger are
1st The action of the internal coat of the stomach
2d The remains of the last meal
3d The Bile effused into the stomach & the gastric juice. Bile may produce morbid appetite. Tape worm will produce morbid appetite

The stomach of a robber famous for his inordinate appetite was opened and the ductus communis choledochus found emptying into the stomach

Natural appetite depends on a certain relaxation of the stomach till it arrives at what I call the hungry point. Sudden fear shame grief &c depress the sense of hunger by reducing it below the hungry point In this case stimuli excite appetite

Opium moderate emotions of the mind by exciting the system above the hungry point remove the sense of hunger. Emotions of the mind sometimes produce appetite by elevating the system to the hungry point

Hunger when acute is a most violent disease producing great pain. The moral faculty is also

affected. It has been said to break thro stone walls but it has done more, thro the medium of a diseased moral faculty it has induced mothers to kill their children and eat them. It has even made people eat their own flesh. Sailors shipwrecked for instance

That a certain degree of relaxation induces hunger I infer from fear shame &c inducing it. Joy cheerful company & pure air frequently raise the system above it. People have felt hungry after being at a dinner table four or five hours, owing to the cheerful company and conversation keeping them above the hungry point. Gastric juice, Bile and fluids of the stomach may induce hunger, but I believe this appetite morbid. Thus patients in the yellow fever who have the black vomit eat heartily sometimes

The state of the stomach is influenced by
1st The presence of the gastric juice
2 By its absence
3d By its being in too great quantity

There is great sympathy between the eyes and the stomach smelling of food blunts the appetite

In hunger the excitability is increased, hence the death of Mr Otway the poet from eating a loaf of bread after fasting for some time

Causes of Thirst

Thirst is seated in the mouth and fauces, This I infer from certain moist and acid fruits allaying it

The causes wh excite thirst are either partial or general

1st A Certain acrimony of the fluids produced by fevers and after a suppression of urine, this acts generally on the system and renders fluids necessary. Partially from eating salt meats &c

2d A Certain relaxation of the fauces and throat accompanied with dryness & debility to the degree I have called the thirsty point

3d From Opium Digitalis &c wh induce indirect debility & thirst

Fear. Pain, Opium &c reduce or elevate thirst according to their quantity & severity of action excity the system above or below the thirsty point

Teeth We shd here remark that we shed our teeth in childhood because they have not grown into the Jaw. There is no reintegration of any part of the teeth. They are situated in a spongy part of the Jaw & are of a conical form by wh they are able to sustain pressure. The Molar teeth have 3 prongs by wh they are prevented from puncturing the Maxillary sinus

They masticate the food, and triturate it so that it becomes mixed with the saliva from the Salivary glands

The Tongue serves to push the food about so as to expose it more fully to the action of the teeth & thence protudes it to the Epiglottis & Oesophagus whence it passes into the stomach

Stomach The stomach is a most important viscus. It is possessed by all animals, the Tenia excepted. There are more animals that have stomach than brain

The stomach is furnished with nerves for secretion. and the par vagum & 8th pair for specific sensation. The stomach is so full of nerves that it may be compared to a tendinous expansion

By the par vagum & 8th pair, the stomach is chiefly connected to the Brain, Next to the Brain the stomach has the greatest sympathy with all parts of the body; from this circumstance Van Helmont thought it was the seat of the soul. The stomach is the Index of the nervous System Like the face of a clock it tells the state of the system We shd always make inquiries respecting the state of the stomach, by it we learn the grades of disease and also the state of the mind. If a maniac determine to do a peice of work and he chance to belch before he undertakes it he will desist from attempting it. The stomach possesses a power of transmutation &c

Digestion

Has been attributed to two agents 1st Mechanically by trituration only 2d Chemically which includes heat, solution fermentation & Putrifaction. Much has been ascribed to trituration in digestion Dr Pitcairn has computed the force of the stomach in digestion at 12,951 lbs

Dr Boerhave says it is equal to all the muscles in the body That trituration does not influence the process of digestion I infer from some experiments of Spallanzani He swallowed 25 Cherries out of wh 18 were voided without being broken. If the force of the stomach was not sufficient to break this tender fruit, it can have but little influence on digestion

Next the Chemical. I reject putrefaction as an assistant altogether in the process of digestion. It renders aliments unfit for chyle & further we find from experiments, that any putrid substance taken into the stomach, is rendered sweet before it is digested

Heat and Solution alone are necessary. That heat is necessary I infer from Polypi wh digest in 12 hours in summer as much as they do in 3 or 4 days in winter. Again heat must be present for the process of solution. The gastric juice is capable of dissolving at 44d but the hotter it is the more are its solvent powers increased till it comes to 112d wh appears to be the greatest dissolving power this is a few degrees more than the human stomach

Mr Hunter found that digestion went on in a frog at the temperature of 60° and was checked at 30° Fahrenh

The saliva as well as the gastric juice is necessary to digestion ℥12 of saliva are secreted in 24 hours. The dissolving power of saliva is established. Aliments are sooner dissolved in saliva than in water, many experiments prove this. It is supposed to absorb oxygen. Spallanzani is not entitled to the honour of this discovery Dr Haller knew it and mentioned it in his great work 30 years before Spallanzani made a single experiment on the subject

Solution differs in different animals those wh have gizzards have less occasion for solution than other animals

Perhaps the dissolving power of the gastric juice in man exceeds that in any other animal. In very old people and in children it is greatest. This is necessary to supply the place of mastication wh is less in them from a want of teeth. It acts more powerfully on masticated than on unmasticated food. Hunter says the gastric juice often dissolves the stomach after death, this I doubt the appearances he mentioned must have arisen from previous inflammation & mortification & often appears in the bowels as well as in the stomach

Nervous influence is necessary to digestion. by cutting the 8th pair of nerves digestion is destroyed in Wolves &c

The gastric juice affords by analysis an ammoniacal salt and Phosphoric acid. This acid curdles milk in the stomach of children & Calves. Tho there are many other substances capable of forming this coagulation. The Liver, Lungs and Heart of a turkey do it. also fish when alive. artichoke leaves also and they have no acid

The influence of the whole system is necessary to good digestion. Abstinence & diet in diseases is founded on the power of the gastric juice of the stomach

From this view of digestion it appears to be exclusively an animal process & perhaps it can never be imitated by art.

Phenomena of Digestion 1st after every full meal there is a slight degree of fever wh comes on with a chill it is occasioned by an over proportion of aliment, but is by no means necessarily connected with eating. a preternatural degree of heat and with a gentle perspiration it goes off It is because the excitability is not proportioned that this effect is produced. Hence a knowledge of this fact ought lead us to advise a moderate meal to those who are exposed to cold, as centinels of an army &c

2d A full meal disposes to sleep by inducing indirect debility. This is the effect of stimulus on the brain. It is removed by some by smoking a Segar chewing snuffing a glass of wine

This is not necessarily connected with eating a moderate meal has not this effect

3 The mental faculties are often affected by a full meal this is not necessary, it only occurs after too much has been eaten

4th There is often a disposition to rest after a full meal. Dr Harwood had two hounds, he fed them and set one of them running for 2 hours immediately after having eaten the other he confined at home, in hours he killed them both in the former very little of the meal was digested in the latter nearly the whole

5th A certain state of the atmosphere influences digestion

6th Food sometimes remains 7 hours in the stomach before it is digested, the medium period is 4 hours

7th The passions influence digestion, it is increased by joy and cheerful conversation and retarded by grief & shame From what has been said, Convalescents ought never over eat themselves. Hearty meals often produce apoplexy and even death. In chronic cases I direct six or seven meals instead of two or three a day

After the aliment is digested in the stomach we call it Chyme. After it gets into the duodenum and is mixed with the Bile and juice of the pancreas it is called chyle The matter precipitated from it forms the Basis of the faeces

Complete and perfect digestion requires the aid of another viscus, this is the Liver. This furnishes a fluid which mixes with the Chyme & forms Chyle

Chyme was formerly supposed to be acid & that it lost its acidity by being mixed with the bile & became sweet Bile is supposed by some to be an excrementitious fluid. I do not believe it and I hope to shew you that chyme is not acid

The design of the Liver is to receive the blood from every part & by a secretory process from its peculiar fluid, to be conveyed to the Chyme & to be mixed with it. I think it absorbs fat in famine and furnishes blood.

The Liver is present in all animals & on this point stands on a footing with the stomach

The Cystic & Hepatic bile is very different if $24\frac{2}{3}$ of bile secreted in 24 hours $\frac{5}{6}$ of this passes into the duodenum says Haller

Venous blood of the Liver is less disposed to putrify than that of any other part. This is owing to its containing a quantity of Chyle. In animals that have no gall bladder the hepatic liquor is found to be sweet. The livers of Poultry are sweet

Columbo root is sweet when dug up, but grows bitter by keeping may not this be the case with the bile

The Pancreatic Juice is a solvent like the saliva, It is mixed with the chyme to form perfect chyle

Intemperance increases the labour & size of the Liver

Uses of the Gall Bladder

The Gall bladder seems to act the same office with the liver that the spleen does with the arterial system. It appears to be designed to contain redundant bile. It is possible that the less nutritious part of the bile is thrown into the gall bladder. Perhaps the bitterness of bile depends on its stagnation as the bitterness of the wax in the ear is occasioned by that circumstance. Bile serves to precipitate those parts of the chyme not fitted to form good chyle

The Liver is called by some an excretory & secretory organ. I adopt this opinion. The duodenum is the receptacle of the lymphatic faces. While the stomach is most active, the Liver from the pressure of the former is most idle

I differ from all modern Physiologists in supposing that the pressure of the stomach arests the secretion of bile. I am supported in this opinion by the fact that pressure on any gland arests its secretion

Dr Haller says that in animals with no gall bladder, the bile is sweet. The hepatic bile is always sweet in infants. Dr Fordyce found that chyle was made without the aid of bile

In inflammations of the Liver, the blood is not always sizy, in these cases chyle is not perfectly made & it is from the chyle that coagulable lymph wh forms the buffy coat is produced

The fator of stools is derived from the bile. In high grades of bilious fever, the stools are not fated tile the disease begins to be arested by Purges &c After this the stools are fated. This was one way by wh I was enabled to know the state of my patient & that even before entering the room

There are often found among children some who have hard bellies. This is owing to an enlarged liver. Some have supposed this enlarged state of the liver to depend on wind. but I think it owing to an engorgement of bile

We often see persons with full blood vessels who have not eaten any thing for a length of time. This must be produced by an absorption of fat from the omentum which is carried to the liver and changed into Chyle. Dr Haller once found a lump of fat in the vena portaeum In this case it is probable that the lymphatics were relaxed & admitted the fat in its uncommuted state

There is an extensive sympathy between the liver and stomach. Dr Thompson says that in the East Indies a diseased stomach is frequently a symptom of a diseased liver

I refer you to the dissertation of my son James Rush MD on the functions of the omentum

The Liver is a second Chylopoetic organ in wh is

prepared Chyle from the fat wh the lymphatics absorb from the omentum and carry to the Liver

The Chyle is conveyed from the intestines by the Lacteals wh are spread about the intestines & wh terminate in the 4 or 5 Channels all emptying into the Receptaculum Chyli & Thoracic duct. Thence it passes to the left subclavian vein to be carried to be carried to the heart where it is converted into blood.

Of the Nature of the blood

The blood consists of several different parts. When taken from the arm a watery halitus arises. After this it seperates into Crassamentum or Cruor & Serum

The Crassamentum consists of coagulating lymph & red globules. The fluid part is the Serum

The blood is the same in all animals of the same age where it is of a red colour

Coagulating lymph is common to the blood of all animals whether the globules be red or white. It is absent in the Fetus sometimes & pale in infants & red in youth. It stagnates in different parts & coagulates forming ecchymosis. It coagulates when exposed to air. Various circumstances retard or accelerate its coagulation

In bleeding the quantity of coagulating lymph

according to the velocity with wh it is drawn, if this be great more will be seperated than if it bled guttatim

The shape of the vessel into which the blood flows influences its coagulation. There is more buff when the blood is drawn from the arm into a shallow dish, than when into a deep one, it coagulates sooner in a cold room than in a warm one, slower in earthen and wooden vessels than in metallic ones, because the former are slower conductors of heat. To produce the buffy coat, or size, the action of the vessels must be open and full, it occurs in Pregnancy & in all people in the spring of the year. The contact of air influences it. hence the buff coat is on the surface & not below

When the action of the vessels is very violent, the buff appears more feebly. in Bilious pleurisy buff is not evident; when the Bilious symptoms are reduced there is nothing more left than common inflammation & here now is the buffy coat

In the highest grades of inflammation as Plague & Fever &c the blood refuses to coagulate, it dissolves. This dissolution of the blood was formerly ascribed to putrefaction, but this is not the case. It is owing entirely to violent action in the bloodvessels I infer this from its taking place in arteries before in veins because the action of arteries is greater than in veins

Blood is dissolved by the venom of vipers. It is also dissolved by carbonic acid gas when taken in sufficient quantities to occasion death

By giving Nitre Sal Soda &c we decrease the disposition

of the blood to coagulate, Nitre produces its effects wholly by reducing the action of the bloodvessels. The bloodvessels & the blood stimulate each other as the Brain & the heart do

The cure of tetanus consists in bringing back the plus excitement of the muscles to the minus excitement of the blood vessels

Polypi arise from a deposition of coagulable lymph, on the abraided coat of an artery

Dissolution of the blood is owing to the violent mechanical action of the vessels & not to putrifaction. A too feeble action of the vessels produces dissolution of the blood as in scurvy

The coagulating lymph is said to be possessed of vitality that is what I call its capacity of life. When fibrine or coagulating lymph is subjected to the action of Galvanism, motion is perceived in it. In violent action of the bloodvessels the blood is as it were whipt & converted into coagulable lymph

I shall show that pregnancy is a disease, that parturition is a violent paroxysm of disease. The buff coat in pregnancy is owing to inflammatory action, the fibrin forms new animal matter. The fluids like the solids are animalized in health, but become animated by disease, May not the matter wh forms the fœtus & nourishes it be derived from this disease of the mother by wh the coagulating lymph becomes animated? I think it very probable

How humiliating then is the condition of man. He is conceived in disease, made up of disease & Brought forth in disease Life is excited in the fluids by the stimulus of disease

Perhaps the fibrine of the blood has no more sensibility than other matter, until affected by disease. The Coagulating lymp appears to be a great single muscle. The venom of the viper in one place destroys the whole texture of the blood, this is by sympathy of continuity, the fibrin of the blood is an unit its dipolution by violent action may be called apparent death When stimulated to a coagulating state, I call it, resuscitation By this coagulation the pleura adheres to the lungs, here the Coagulating lymph is animated & becomes Vascular

Serum is water with a number of salts held in solution It is seldom in a simple state in the vessels, it is mostly mixed with a little lymph, its use is to carry saline matters out of the body, It is by its excess & stagnation that partial and universal dropsies are occasioned

Red Globules From late observations it appears that that the red part of the blood is not globular. I have viewed them with an excellent microscope of Dr Hewson & they always appear in the form of a Holland Cream cheese, their size has been computed by Mr Hunter to be the 3000th part of an inch

The oxygen of nitre is the cause of the red colour wh Ham & Bay receive from Nitre. The blood of an adult is supposed to contain ℥ij of Iron. The red colour of the blood in some faces is owing to its imperfect oxydation in the lungs. The red globules are not the most essential parts of the blood good health depends in part on an equable mixture of red globules with serum, they give tone to the blood vessels and strength to the whole body. The red globules by forcing its way into serous vessels occasion inflammation. The quantity of blood in a man is supposed to be 25 lb

Blood is the source of all the secretions

Use of the Spleen

To this viscus four uses were formerly ascribed

1st The preperation of blood for the secretion of bile

2 It is said that the red globules are formed in it

3 To afford a supply of blood for the stomach

Some viscera are our friends in health but the spleen is our friend in disease

Mr Home says there is a direct communication between the stomach & the spleen. He tied up the pylorus and the liquor was carried from the stomach to the spleen. The spleen performs the office of a basin held by the hand

of nature to contain redundant blood. The spleen has but one artery & that is larger than that of the Liver. The spleen has no excretory duct. The diameter of the spleen is 3 times larger than that of the artery, the latter is much stronger than the aorta

The spleen will admit of an increase of weight of 1 lb 4 without any enlargement of size. It is placed in the left side of the body and is never lessened in size by fat

In laughing, the spleen opens a waste gate for the blood to pass thro'. When sudden death occurs from laughing it arises from the rupture of the spleen

The pain which we feel in running riding &c is seated in the spleen. The blood in the spleen is less coagulable than that taken from the arm. This is owing to the force with which it is sent to the spleen. The spleen defends the system from injuries of various kinds. hemorrhagies often occur from a large and obstructed spleen. In wounds & inflammation of the spleen there is but little pain. Hippocrates thot that bleeding from the nose was owing to obstructed spleens

The spleen is one of the most useful viscera of the body in violent actions of the bloodvessels it opens its friendly door to receive the redundant blood. When this is refused sudden death often happens

The loss of the spleen is attended with disease, the liver is thereby enlarged

The Liver has an auxiliary viz the gall bladder, various other organs are assisted in their functions & why may not the spleen give its assistance to the arterial system when necessary

Of the Thyroid and Thymus Glands

The design of the thyroid gland is to defend the brain from the morbid effects of those causes wh determine too great a quantity of blood to it. That this is the case I infer from various reasons

This gland is situated on the Trachea. It is larger in women than in men. It has arteries to supply it & no excretory duct. From the effects produced by disease an extirpation of the thyroid gland & madness produced in dogs by cutting it away - - - . It is larger in women than in men, because their bodily diseases are more violent & this gland is larger to defend the brain from the inordinate action of the system. The globus hystericus in women is nothing but an enlargement of this gland. It is probable that the greater irritability of this gland in women is the cause why Bronchocele in them so often - - - Imbecility of mind has been supposed to be the effect of the want of this gland

The Thymus gland appears to answer the same end to the lungs that the thyroid does to the brain. It counteracts the inordinate action of the blood sent to the lungs. The lungs of children require the outlet. It absence in advanced age is owing to the action of the air by habit becoming agreeable. It continues longer in women than in men & sometimes in the former it does not disappear at all, because their lungs are more often & violently distended than those of men.

Lymphatics

These are a system of small vessels arising from all the cavities of the body & conveying their fluids to the thora=cic duct. Tho some are said by Munro not to go to the Thoracic duct. I think they take up their fluids by the action of the vessels themselves. How is the lymph for=warded to the thoracic duct? By the pulsation of the contiguous arteries — By the pressure of the contiguous muscles & by the specific stimulus of the lymph exci=ting action in the vessels themselves

They possess coats like the bloodvessels as appear from their contractions. They are much stronger in proportion than the latter. they are all endowed with valves to prevent the reflux of the lymph. They are endowed with nerves arteries & veins & have regular circulation. They have been supposed to have mouths by wh they absorb from

the surface of the skin. The Lymphatic glands appear to be cellular Mr Hewson says they are not. The Lymphatics are said to possess a retrograde power Dr Darwin advocated this opinion

The Lympt of these vessels is coagulable, in Dropsy the Lympt is less coagulable than in health. Mr Hewson says this is owing to increased action in these vessels. The Lympt is supposed to be taken up by capillary attraction I think it is effected by the action of the muscles, by the pulsation of the adjacent arteries

Lympt acts on the lymphatics, as the blood does on the blood vessels

In strabismus, in Hydrocephalus, Physicians mostly suppose an effusion to have taken place I have seen cases of this where effusion had not taken place

The Lymphatics absorb solids as well as fluids, the thyroid gland being removed, the disappearance of small fractured peices of bone in certain diseases, boney matter in the urine, disappearance of Tumours & wens &c all prove this

The arteries & lymphatics appear to perform different offices, the former repair the latter destroy certain parts, on the strife maintained between these health seems to depend, And no sooner do we see

an armistice take place than Diabetes Scrophula &c appear

Dr Dangerfields experiments to determine whether turpentine is absorbed by the lymphatics

Dr Franklin first discovered that turpentine changed the smell of urine

No lymphatics have yet been discovered to open on the surface of the skin. It is true lymphatics exist under the skin

The stimulus of ~~thirst~~ opium relieves ~~opium~~ thirst by sympathy

Dr Currie has proved that in many cases no increase of weight resulted from putting the body into a solution of salt

Variolous matter is not taken up from the skin unless an opening be made. When mercury affects the mouth it is not owing to absorption by the skin but by the vapour of the ointment being inhaled. It is more easily exhaled from the axilla

Dr Mussey of Massachusets has attempted in his inaugural dissertation to prove cutaneous absorption. After lying in madder for a short time he found his urine to be coloured with it. The madder had passed thro the skin. The same effects take place in drinking madder

I remark that madder is one of the most penetrating substances in nature, is it not possible that it may pass thro the pores by

It is said that the Lymphatics have an affinity

for some things and an inappetency for others. I consi
der the lymphatics as omnivorous

I know of no advantage from the absorption of substan
ces by the skin. It wd be a source of disease. Every lym=
phatic wd afford an avenue for the passage of death

The Lymphatics are excited into action by distension
by pressure &c Dr Mussi relates a case where the ster
num was absorbed by the pressure of the aorta

The lymphatics are excited by friction, by vomiting
Stimulating passions act on the Lymphatics I refer
you to my medical inquiries

The Lymphatics serve an important purpose in
enlarging the body. —— They act as scavengers
in removing filth from the streets of a City

Dr La Roche had a case of Hepatitis where the Liver
had suppurated the patient expectorated pus, on open=
ing the Liver after death, no communication between
the Lungs and liver was evident

Secretion

Various theories have been given on the change of blood for
the different secretions

The fluids secreted are lymph Bile Saliva Pancreatic
juice gastric juice Fat synovia Semen &c

The liquors secreted are all different in their nature and

from the same origin — the Blood

1st Lymph this is coagulable, lymph in diseases is dissolved like the blood. It is not coagulable in anasarca

2d Salivа This yields by analysis Water, mucilage, Albumen Phosphate of Soda, lime &c. It assists in forming an oxyd of mercury. It is much changed by disease. When exposed to the air it emits an offensive odour. May not mercury produce the same effects on saliva as putrefaction 12 ℥ of it are secreted in 24 hours

3d The gastric Juice contains animal salt yields phosphoric acid. The gastric juice is a solvent. It is strongest in young and old people, for wise purposes, it becomes more acid in age increasing its solvent power. Its power is increased by diet

4th Mucus is diffused thro various parts of the body, in the Oesophagus, Stomach Bowels, Urethra Vagina &c

5th Synovia Juice is secreted during the night. It is wasted during the day, as is found by measuring the body in the morning & at night, when it is found to have lost half an inch. I believe this was first discovered by a soldier

The Synovia contains various salts

6th ~~Urine~~ This combined with oxygen is said to form calcu=
=lus, no uniform solvent has been found for the calculus

Exercise of the passions influences the quantity of urine
the urine of children is more bland than that of adults, the
urine of old people acquires a fœtid smell

The kidnies and the bowels alternate in their action
with the weather

7th Semen has a disagreeable smell and a pungent
taste, perhaps we might ascribe the changes wh take
place at puberty to the formation of semen. It changes
the syrup of violets

Semen is fecundating and contains numerous ani=
malcula. By intemperate venery it becomes thin &
watery. In old people it partakes of the acid quality
of the Faces

8 Liquor of the Prostrate Gland partakes
of the nature of mucus. May it not be intended to
sheath the acrimony of the seminal fluid. I know
no other reason

9th Tears are watery transparent & of a greenish
colour. They change the colour of violets. They
yield different salts

10th Milk is a secreted liquor obtained from the

blood by a peculiar process. The milk seems to be formed from fresh chyle. It appears to be like Chyle, it is like chyle as serum is like urine. that it is obtained from chyle is infered from various circumstances

Milk is composed of oil, mucilage, Water and sugar. The oil yields butter. The mucilage cheese The water yields whey.

From this it appears that milk is of the most nutritious nature. Hence it sh never be prescribed when we wish to depete the system. the secretion of milk is much affected by certain passions of the mind

The milk is never affected by disease chyle

11th Fat is contained in small cavities. It is the product of diseases general or local. It is most liquid in hollow parts of the body. It melts by exercise. It is mostly met with on large muscles and on the intestines. Some persons acquire and others loose it in a very short time

Sailors and Soldiers seldom have much fat. Fat gives a regular contour to the body, on the face it gives beauty It is said to prevent the effects of cold. It supplies the body with nourishment in disease. Fat people discharge less blood than lean people do

Fat by analysis yields fluid oil acid charcoal

Excretions

Alexander the great, whose ambition went beyond all bounds, was heard to say that were it not for his passion for women, he wd imagine himself a god. If he had only reflected that he was necessarily subjected to discharge an offensive mass of loathsome matter daily he wd have believed that he was on a footing with the meanest subject in his empire.

The excretions are 1st Faces 2d Bile 3d Perspiration & some say sweat

1st Faces These are precipitated from the Chyme by the bile & pass into the lower bowels and putrify as they descend

It contains sulphurated hydrogen gas
Few experiments have been made on the pure gas. Dr Priestley who was always engaged with these subjects had like to have been injured by an experiment on this gas. As some of it was discharging from his anus or back door, he placed a candle to it and it suddenly exploded.

It changes the Syrup of Violets

2d The Bile. The colour of the bile is yellow sometimes green, sometimes black

The Bile influences the peristaltic motion of the intestines
The passions influence the secretion of Bile, hence an angry man is called a cholerie man

The Bile is composed of albumen, oil, salts &c some say it contains an oxyd of Iron. a small quantity of saccharine matter, hence I infer the Liver to be a chylopoetic organ

3d Perspiration The question is asked how do you know that any matter is discharged from the skin, since it is not sensible. the answer wash the arm and wipe it dry & introduce it into a cylindrical glass & a cloudiness will soon appear on the inner surface of it

Winslow says that he saw the perspiration ascend from the head of a man

Malpighi thot that it was a secretion Buyph has denied this and proved the contrary

What is the nature of the matter of perspiration
1st It is water 2d Limpid 3d Saline

Dr Clapp proved it non astringent. It has a peculiar odour said to be derived from an oil, this odour is very perceptible

It is different in different people in hard workers it is most fœtid, Six Hatchmakers do not change the air of a room more than two carpenters. It differs in age

Mr Bichat says he knew a man who could distinguish a virgin from a married woman merely by the odour of their

Child bearing alters the quality of the perspiration

Food alters the quality, the smell of a Church in Greenland was insupportable to a Gent who was there by accident merely because the inhabitants lived on Whale oil

Perspiration contains a glutinous matter. The quantity discharged in 24 hours has not been ascertained, it is from 20 to 50 ℥

Perspiration is greater after divided meals, more increased by liquid than by solid food. It is more profuse in men than in women & hence one cause of their monthly evacuations

Sometimes we perspire more in sleep than when awake Motion and rest influences its quantity. Passions of the mind gratification of the venereal appetite increase it

When the kidneys or bowels are ostructed, their contents often pass by the perspirable vessels

In great agony it is sometimes changed into blood or blood is forced into its vessels and discharged. Thus the saying of our Saviour sweating great drops of blood is strictly true

Nutrition

This is completed by animalization. Dr Haller has proved that the heart and arteries are formed prior to the Brain & Nerves in the Chick in Ovo

It is said that no motion is evident in the heart till the formation of red blood. So that it seems that red blood is necessary to give the first impulse to the heart. They act secondarily on the Brain & nerves, these thirdly react & by their stimulus excite the heart & blood vessels. after wh they appear to act reciprocally on each other & life results from this reciprocal action. The first stimulus is the blood, then the heart arteries &c

1st The arteries prepare & convey nourishment to the different parts of the body. The Brain of a ox is 1/6 as large as a mans yet an ox is 6 times larger than a man

2d Monsters without Brain are nourished as well as those with it

3d Parts wh have very few nerves are nourished as well as those with a great quantity

4th Dr Murroe destroyed the sciatic nerve of a frog, the frog lived for years after & this leg was nourished as well as the other one

5 Madder enters the Circulation & passing thro the vessels is conveyed into the substance of the bones, Madder cd not be conveyed by the nerves

6th The kinds of matter supplied by the blood is various

The nerves always contain a similar fluid

Hence then we see the importance of the blood vessels they have formerly been too much overlooked

As a punishment for crimes with some Indians they are forced to hold up their arms for months by which they are greatly emaciated

Boerhaave attributed the changes of the body by dis= ease, to an alteration in the blood & overlooked the vessels al= together. Cullen & Brown ascribe the phenomena of disease to the nerves

We shd look for the seat of diseases in every system of the body, but chiefly in the blood vessels

All parts of the body are said to be renewed every 7 years, this is not the case

Hitherto we have considered the functions common to both sexes. We come next to those which are pe= culiar to each

Peculiarities of the Sexes

Female Sex I shall first consider the peculiarities of their bodies then of their minds

The Peculiarities of their bodies are General & Local

1st General

1st Women in all ages are less than men and acquire

their growth much sooner

2d The texture of the bones is less compact, more soft and yielding hence a female skeleton may be known, by the looseness of the texture of the bones

3d Their cuticle is softer and smoother than that of men. The softness of their skin has been attributed to the more exquisite action of their absorbent vessels wh take up every thing that would change the nature of the skin. The true skin is softer and the cellular membrane more open

4th The heart of a woman is less than that of a man, their hands are less and the liver much larger

5th Their arteries have less strength but more irritability. The internal coat of their arteries is less compact than those of men

6th Their Nerves are more sensible

7th Their Brain is more susceptible of impressions

8 They perspire less than men

Local Peculiarities

1st Their pelvis is wider than mens, hence they retain their urine longer than men

2d Their trochanters are wider apart

3d In the Pelvis is contained the Uterus and its appendages peculiar to the female

4th The external organs of generation differ from those of men

5th They are subject to a monthly discharge

6th They have a large gland in the breast & breasts more prominent & secrete a milky fluid

7th They move the thorax more and the abdomen less in respiration than men

8th Their voice is more shrill and soft

9th They are more long lived, that is more women live to be old than men, but more men than women live to be very old

Thus far have we heard the peculiarities of the female body. we come next to the

Peculiarities of the Female mind

I cannot subscribe to the opinion that the minds of females are the same as those of males

1st Their minds are less vigorous & comprehensive. This has been attributed to the manner of their education by the celebrated Mrs Woolstencraft. But this is not the cause. I think it is natural and original. It is necessary to social as well as domestic happiness that this shd be the case

The minds of women are different from those of men

2 In the Understanding. It is less powerful & vigorous hence we have never heard of a female Newton, Bacon Locke &c

3 Their Imagination is less powerful a Homer or a Milton has never appeared in the female sex

4th In Memory they exceed men in the retention of words names, events &c but not in Ideas, hence women have often received the appellation of almanacs. Their capacity to remember words & events is estimated by Lawyers

5th In Taste they are inferior to men, except in dress. – They are also more polite

6th Their Moral Faculty is more acute and sensible but more circumscribed. They have a more exquisite sense of deity hence they are more devout. Women possess more kindness and Charity, but less benevolence than men, hence we seldom hear of a female citizen of the world. Their humanity is greater than that of men

7th Conscience in women is less sensible than in men, because seldom so much excited. By Education & Custom they are restrained from gross vices & therefore have less exercise ~~than~~ of conscience

They have less veracity

Women afford more pleasure in middle life. They are the chief support of the two extremes of life, infancy & old age

Women are more disposed to despair than men, mothers sooner despair of the recovery of a sick child than fathers

They have quicker Perceptions, but their Reason and Judgement are less acute. Their perceptions are greater in understanding signs. They have more Fortitude but less Courage than men the former is an ~~active~~ passive the latter ~~a passive~~ an active quality of the mind. – Women incline more to society

than men; they are more communicative of secrets, but they are the secrets of others not their own. This is certainly true it is the reverse with men, they communicate their own secrets, not those of others

Women are less disposed to forgive injuries than men this is owing to the weakness of their minds, strong minds are above revenge. A revengeful man deserves petticoats

Women have more delicacy and modesty than men this I think is the effect of nature, it is an instinctive principle A want of chastity is far more detestable in a woman than in a man

There is then an original difference both in the bodies and minds of women & men

Dr Young says A "shameless woman is the worst of men"

Women sometimes shew more courage than men this is an effect of morbid excitement

Let no one however suppose that I have an aversion to the sex, or that my disparagement ~~of the disparagement~~ of the female sex is the result of old age, No, far be it from me, few men have more reason to love the sex than I have It is Reason Observation & Common Sense wh commands me to declare what I have now said

In no place is equality among the human race so completely evident, as in a grave yard

Women are subject to a monthly discharge called Catamenia

The Catamenia are confined to females of the Human species. Some of the monkey race perhaps excepted

2d It occurs at different ages in different climates & different states of society. It generally makes its appearance at 14, In warm climates it occurs at 12 years of age. In cold climates not till 15

I have known three girls menstruate at 7 years of age & Dr - - Mentions several cases where it appeared under 4 years of age. It appears soonest in females in high life. At this time the breasts begin to swell, the eyes have a peculiar brilliancy the voice becomes more musical & the venereal appetite appears

3d The time of its cessation is usually at 45 or 50, but there are many exceptions

Mrs C of this City menstruated till she was nearly 100 Mrs Sinclair in the Pensylvania Hospital had them at 70 Hard drinkers often menstruate at 60 In some cases it returns after ceasing for many years. When this occurs it is an effort of the system to renovate itself. It has its analogy in other parts of the body, the teeth and also the hearing have been ~~often~~ renewed after being long absent, perhaps it was in this way that the people lived in the antideluvian age. The menses cease soonest in hard working people. The quantity discharged in our climate

at the regular period is about ℥IV, It continues 3 or 4 days. It recurs every lunar month. The blood discharged has no peculiar smell nor morbid quality

Recollect Gent the quantity discharged, you see it wd not be safe to trust the cure of inflammatory fevers to it

It generally ceases during pregnancy and giving suck tho' to these ~~these~~ are exceptions. Some women menstruate regularly during pregnancy & giving suck, this comes from the vagina and not from the uterus

Abortion never takes place in consequence of the menstrual discharge

The menses generally return after giving suck for eleven months

Women are more susceptible of impressions during pregnancy than in the intervals

A disease during menstruation is more violent than at any other period, they have then 2 diseases. Some women can thus tell the coming changes of the weather their pulse is raised

I believe that menstruation is a disease, the state of the system indicates that morbid excitement has taken place

The menses continue during many diseases as in Mania &c we often find them present in violent fevers

Habit is of great influence in preserving their regularity. In treating this subject 3 questions naturally present themselves
1st What is the cause of this monthly discharge
2d What is the cause of its return at stated periods
3d What purpose is it intended to serve

1st Dr Brown says it is owing to the stimulus of the venereal appetite. This is as foreign to truth as it is to delicacy. For it appears in women of the most exemplary chastity & even in those who have never felt the venereal glow. How do we account for its regular appearance in Maniacs

2d Some have ascribed it to a fermentation in the uterus — this is not the case

3d Some suppose it to be collected in a Sinus in Utero where the blood is congested. This anatomy proves to be false

4th It is said to be owing to a plethora To this women are always disposed by their perspiring less than men. To this last opinion modern Physiologists agree

Is the Plethora general or does it reside in Utero? I agree to both. There is often a translation of the menses from the Uterus to other parts. Thus the menses have been discharged from the Lungs Eyes &c. Here we see vicarious services performed by different parts

That it arises from Plethora I infer from diseases wh debilitate the system stopping the menses

The appetite is often unimpaired in the Menses. Women are more subject to diseases of the Inflammatory type than men, from the symptoms attending the menses being such as precede plethora & Congestion in other diseases

The Menses is a disease first general to the system and then determined locally to the Uterus

The Blood is discharged from the arteries alone and not from the veins, it does not coagulate

Causes of its return

It cannot be from the influence of the moon, else all women wd menstruate at the same time, whereas they do not. A month seems necessary. It must be owing to association and habit, like Intermittents

What purpose is it intended to serve

1st To nourish the Fœtus. To this there are several objections 1st all animals do not menstruate 2d Women bear children both before and after menstruation. This however is a very rare occurrence.

Brutes have a certain season for the recurrence of the venereal appetite &c &c

I invert Dr Browns theory instead of making the venereal appetite the cause of the menses I wd make it the effect

The only use of Menses is to excite that fulness &c in the Uterus necessary to gestation

Women are more apt to become pregnant immediately after & before the discharge than at any other time

They seldom become pregnant before one or two menstrations. Yet they sometimes do before the commencement & after the cessation, but this I consider as a departure from the Laws of Nature

Much has been said of Hermaphrodites in the Human species, there are no such beings

Peculiarities of the Male

1st Their organs of Generation for this refer you to anatomy
2d Changes wh take place at puberty, these are 1st an enlargement of the bones of the forehead, the breast spreads, hoarse voice, appearance of the beard. Eruptions on the skin and throat and the appearance of the venereal appetite, this mostly occurs about the 14th year, but sometimes much earlier & sometimes later, Much depends on climate and the manner of living. Dr Haller says that a boy 3 years old had a beard, this was a monster a lusus naturæ

These changes have been ascribed to the absorption of semen. Since in Eunuchs no such symptoms appear. I object to it, because it is entirely hypothetical. The vene-

real appetite is produced by the stimulus of seed in the seminal vessels. This stimulus has produced mania and even death

The stimulus of a glass of wine is felt in the stomach before it could have produced its effects

The symptoms of conception are owing to the stimulus of semen, not to an absorption of it

Morph is the red nose of women in pregnancy

The shrill voice, weakness want of beard &c in Eunuchs is the effect of debility produced by relaxation from the want of seminal stimulus

The gratification of the venereal appetite is always followed by debility. That peculiar smell of those arriving at maturity is owing to a more vigorous circulation from the stimulus of semen

No changes are induced in the female sex from the absorption of seed. Hunters animal oeconomy

The male & female shd not receive the embraces of each other till the former is twenty one and the latter 16 years of age

Many animals injoy the venereal appetite in a much superior degree to man. A proof this that man was formed for nobler ends

Generation

The obligations of the ~~matrimony~~ matrimony are as universal as the venereal appetite. In every class and situation of life, the venereal appetite exists whether in slaves or kings. The children of Israel multiplied in their slavery. The same takes place with the blacks in the West Indies. A slave after working hard all day will walk 12 miles at night to comply with a venereal assignation

Nothing can eradicate this appetite, neither religion nor reason, the Proximity of death nor the shaking of the earth from earthquakes

The Convalescents who were lying in Bush Hill hospital in the Malaignant fever in 1793 were found gratifying their venereal appetites. Also during the Earthquake which desolated the City of Lisbon &c

The venereal appetite is present at all ages. Mr Potter had a child at 92 years of age by a wife who played about his knees, — Old Parr was convicted of a rape at the age of 120.

No man can live without venereal desires and no one can indulge it without sinning except in Matrimony

The venereal appetite is present in all seasons. The inordinate gratification occasions debility. — In Prussia if a man seduces a woman, he is obliged to maintain her & she is the chief heir to his estate

Soon after the invention of the microscope, the male semen was supposed to be full of animalculæ. The female uterus the matrix into wh this is received. The existence of animalculæ is admitted by all. The semen is their proper element out of it they perish

Spallanzani proved that the female ovum contained the embryo & that it was the male semen wh by its stimulus gave the first spring to life

Hunter says that the semen is highly pungent and stimulant to the taste. Stimulus then is not only necessary for the support of life but for the production of living animals

Death is our natural state, we are forced into existence & kept existing by stimulus. When stimulus is abstracted death ensues

Generation is performed as follows. The male seed is ejected in the act of coition and received into the cavity of the uterus

How is the male seed brought into contact with the ovum. I answer by absorption. It is said that the fimbriæ of the Fallopian tubes seize the ovum & convey it into the uterus where it comes into contact with the male seed. This opinion I do not adopt, because fetuses are found in the ovaria and Fallopian Tubes. Because the uterus remains impervious and closed during

conception

Because impregnation has been known to take place when the semen, was not conveyed into the uterus, as by a penis not a quarter of the ordinary length & when it has been only introduced into the entrance of the vagina. Dr L delivered a woman whose hymen was not ruptured & Dr Johnson relates several similar cases. Here it was probably effected by the absorption of seed from the mouth of the Urethra

Clouds & darkness hang over and envelope the secrets of nature

It has been said that the ovaria are seperated by the energy of the venereal orgasm, but there are instances where this will not explain it as in Rapes

I have said from absorption in favour of this opinion I will relate an experiment of Spallanzani. He dissolved 3 drops of the semen of a frog in a pint of water. One drop of this liquor impregnated a female when introduced into the vagina. Now if so small a quantity as was contained in one drop of this water was sufficient for impregnation can we have any difficulty in supposing the semen to be absorbed into the Circulation & a portion of it to be brot into contact with the ovum

This was the opinion of Dr Harvey & I know of none more rational or probable. The reason why the semen produced no ill effects on the system by its absorption is that it is a specific stimulus, capable of

of producing only this one action (just as variolous matter will not operate on the stomach) & the whole mass of blood wd not dilute the quantity of semen emitted in Copulation more than the pint of water did the semen of the frog

No more happens here than in poisons. A single grain of corros. sublim. has been known to induce a salivation. Now the semen being a specific stimulus no inconvenience results from unprolifical connexions

Another theory is Mr John Hunters, all secreting passages have a peculiar peristaltic motion, as is evident in the Urethra in Gonorrhea, in the Trachea, Bowels, Stomach &c. There is sometimes an inversion of this peristaltic motion as is seen in Cardialgia, Sputatoria or Water-brash. May not the Fallopian Tubes and Vagina in like manner have an inversion of the Peristaltic motion & the ova be thus conveyed by the motion of the Fallopian tubes to the Uterus. This will account for impregnation with short Penis's & unruptured hymens, but this is entirely hypothetical

Several circumstances influence this theory as the activity of the male semen, the absorbing powers of the vagina, the excitability of the ovaria &c &c

Conception has been said by Mr Hayton to be the effect of specific sympathy

Spallanzani proved that no impregnation took place except the semen came into contact with the ovum

Symptoms of conception, as pain in the head, nausea &c are the effects of a new and specific stimulus acting on a sensible part of the body and are to be relieved by the antiphlogistic method. I will mention 2 uncommon symptoms that came under my notice. One always felt a coldness succeeded by a glowing heat in one of her legs. The other always felt an inclination to steal every thing she cd lay her hands on

The Breeding sickness is not necessarily connected with conception

The final Cause of these symptoms is to guard the system against the inflammatory diseases to wh at this period it is predisposed

The whole process of conception is carried on by the Ovaria and nourished by the uterus

The ovaria may be compared to a hot bed, the uterus is a green house to contain the plants, most of the symptoms of conception cease in 3 months

I have considered conception as a disease

The presence of the hymen in the female has been supposed to be a test of virtue and its absence a sign of vice. This

however is not the case, it may be ruptured by riding by sneezing &c and by disease

It is often renewed

The semen is formed from the solids and fluids of the body The absorption of this liquor at the age of puberty was formerly supposed to be the cause of the alteration in the system at that age, but it appears to be an effect. That is the reaction of the system is not performed till the body has acquired this vigour. It is derived not only from the body but from the mind also, every part of the body clubs its proportion & the mind influences it. — This obtains also to women, Hence children resemble their parents

The formation of the ova is the cause of the changes in the female at the same period &c.

Parturition

The usual period of pregnancy is 9 months, ths instances have occurred of women being with child 13 Mo & 5 Mo is the shortest time ever known of living children being expelled from the uterus. Harvey relates a case of a child surviving wh was born 6 months after conception. It will be of importance to know these facts as the peace of families may in some cases be preserved by a knowledge of them

At the close of the period of natural pregnancy the fœtus makes efforts to free itself from confinement. a change in the position of the child probably produces the throes of the mother wh are exquisitely painful

Death is sometimes induced merely from this pain. Pain has been supposed necessarily connected with childbirth this I do not beleive to be the case, altho it was the curse pro= nounced on woman after her fall

In the West Indies and in Africa we are told the women have less pain during Parturition than in Northern Climates. Women in Sicily have very little pain according to Brydone. The Turkish women mitigate their labour pains by drinking sweet oil 2 or 3 months before parturition. It act by bringing on debility of the alimentary Canal

These pains are as much a disease as Pleurisy or Colic and are to be treated with similar remedies, the chief of wh is bloodletting. This has been established by Dr Dewees. The discovery of it says Dr Shippen marks a conspicuous Era in the history of Midwifery

In all cases of easy labour, there is either direct or indirect debility, this is usually chronic Of acts by inducing debility from abstraction

The pain of parturition is not felt in Epilepsy, I knew a woman who was delivered in Epilepsy & when the fit was over she looked at the child and asked whose it was? she was an= swered it was hers she could scarcely beleive it, till she was convinced by feeling the laxity of her belly

The Marks which are sometimes found on the bodies of Children how are they produced

By an effusion on the delicate fœtus — not by imagination
Different stages of life come in under Pathology

Here Gent, we finish our Physiology. I cannot take leave of this subject without recommending it to your serious consideration

Health is that state of the system in wh the excitement and excitability are in equilibrio or exact ratio & both equally diffused thro every part of the body and the mind. This definition excludes strength altogether from health, the most effeminate citizen may be as healthy as the most robust hard working peasant. If health consisted in strength a man wd be in better health than a child, but this is not the case

Is it possible for man to be always in health. Some have supposed it possible to live forever in good health But this is impossible. It is irreligious for "Dust thou art and unto dust thou shall return. We may however in future attain to the antideluvian age

We now take our last pleasing view of the body and mind of man. Hitherto we have beheld his form beautiful, his muscles filled with blood his bones with marrow, his whole frame in action

and endowed with vivacity. But we are soon to view him rugged, emaciated, pale, sickly and even in the Jaws of death.

Not an anchor was ever cast into the current of time, wh could arrest for a moment our progress down the ever flowing stream of life.

FINIS